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ABSTRACT

The main purpose of this report is to help novice reviewers accelerate their apprenticeship at the Nuclear Safety Information Center, a computerized information service sponsored by the U.S. Atomic Energy Commission. Guidelines for reviewers are presented in Part 1; Part 2 contains guidelines for the novice editor. The goal of the reviewers and the editor is to ensure that meaningful correctly indexed abstracts of nuclear-safety information move quickly from the Center to the computer, which is used in making fast literature searches for those who subscribe to its services. Many examples, with comments, are provided to illustrate key points, and the slant is toward useful integration of certain aspects of the jobs so that subscribers can be reasonably satisfied with the literature searches they request. (Author/AB)

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Nuclear Safety Information Center

GUIDELINES FOR REVIEWERS AND THE EDITOR AT THE NUCLEAR SAFETY INFORMATION CENTER ②

H. B. Whetsel ①
Reactor Division

JANUARY 1970 ⑤

LI 002 948

OAK RIDGE NATIONAL LABORATORY ③
Oak Ridge, Tennessee
operated by
UNION CARBIDE CORPORATION
for the
U.S. ATOMIC ENERGY COMMISSION ④

1628

FOREWORD

The Nuclear Safety Information Center was established in March 1963 at the Oak Ridge National Laboratory under the sponsorship of the U. S. Atomic Energy Commission to serve as a focal point for the collection, storage, evaluation, and dissemination of nuclear safety information. A system of keywords is used to index the information cataloged by the Center. The title, author, installation, abstract, and keywords for each document reviewed is recorded on magnetic tape at the central computer facility in Oak Ridge. The references are cataloged according to the following categories:

1. General Safety Criteria
2. Siting of Nuclear Facilities
3. Transportation and Handling of Radioactive Materials
4. Aerospace Safety
5. Accident Analysis
6. Reactor Transients, Kinetics, and Stability
7. Fission Product Release, Transport, and Removal
8. Sources of Energy Release Under Accident Conditions
9. Nuclear Instrumentation, Control, and Safety Systems
10. Electrical Power Systems
11. Containment of Nuclear Facilities
12. Plant Safety Features
13. Radiochemical Plant Safety
14. Radionuclide Release and Movement in the Environment
15. Environmental Surveys, Monitoring, and Radiation Exposure of Man
16. Meteorological Considerations
17. Operational Safety and Experience
18. Safety Analysis and Design Reports
19. Bibliographies

Computer programs have been developed that enable NSIC to (1) produce a quarterly indexed bibliography of its accessions (issued with ORNL-NSIC report numbers); (2) operate a routine program of Selective Dissemination of Information (SDI) to individuals according to their particular profile of interest; and (3) make retrospective searches of the references on the tapes.

Other services of the Center include principally (1) preparation of state-of-the-art reports (issued with ORNL-NSIC report numbers); (2) cooperation in the preparation of the bimonthly technical progress review, Nuclear Safety; (3) answering technical inquiries as time is available, and (4) providing counsel and guidance on nuclear safety problems.

Services of the NSIC are available without charge to government agencies, research and educational institutions, and the nuclear industry. Under no circumstances do these services include furnishing copies of any documents (except NSIC reports), although all documents may be examined at the Center by qualified personnel. Inquiries concerning the capabilities and operation of the Center may be addressed to

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ABSTRACT

The main purpose of this report is to help novice reviewers accelerate their apprenticeship at the Nuclear Safety Information Center, a computerized information service sponsored by the U. S. Atomic Energy Commission. Guidelines for reviewers are presented in Part 1. A subsidiary but important purpose is to help smooth the way for the novice editor (Part 2).

The common goal of the reviewers and the editor is to help ensure that meaningful correctly indexed abstracts of nuclear-safety information move quickly from the Center to the computer, which is used in making fast literature searches for those who subscribe to our services.

This common goal supports the chief purpose of the Center: to help satisfy the intra- and interdisciplinary curiosity of those engaged in nuclear-safety work, thereby helping promote cross-fertilization of ideas, cross-stimulation of new work, and cross-checking of results.

The report presents guidelines, not detailed recipes. Many examples, with comments, are provided to illustrate key points, providing ready references for the new reviewer or editor. While the two jobs, the general approaches, and the criteria are presented separately, the slant is toward useful integration of certain aspects of the jobs so our subscribers can be reasonably satisfied with the general or specific literature searches that they request.

INTRODUCTION

One important purpose of the Nuclear Safety Information Center (NSIC) at Oak Ridge National Laboratory is to serve industry and the Atomic Energy Commission by collecting, analyzing, indexing, condensing, storing, and disseminating information related to many aspects of nuclear safety.

The coverage is broad, including nuclear safety in the mining of uranium and extending to nuclear power stations, embracing the physical, chemical, and nuclear properties involved in the release, transport, and especially the retention of radioactive fission products to prevent their entering the environment. That environment is not restricted to a small area with a solitary worker in it but includes the total surroundings of a reactor or fuel-processing plant. In fact, our range of attention to nuclear safety extends from uranium mines upward to the mesosphere, and this is reflected in the wide variety of nuclear-safety information that we store and disseminate.

This report concerns two job descriptions at the Center - that of the document reviewer (our name for an abstracter-indexer) and that of the editor (the reviewer's backup man). While the total emphasis is on the reviewer-editor relationship with respect to the storage and retrieval of condensed information - abstracts along with their identifying keywords and other indexing items - it may be useful here to indicate briefly the varied services offered by the Center. The Center not only serves as a focal point for collecting, analyzing, and disseminating nuclear-safety information in the design, analysis, and operation of nuclear facilities, but it publishes indexed bibliographies, answers technical inquiries, and offers counsel and guidance on safety problems. For complete information on the services and activities of the Nuclear Safety Information Center, see Ref. 1. For those interested in services offered by all USAEC-sponsored information and data centers, the directory specified in Ref. 2 will be quite useful. Ref. 3 pertains to a directory of all federally supported information analysis centers. Reviewers and editors interested in a thorough airing of management problems, copyright laws, etc., should read the document referred to in Ref. 4.

Returning to the purpose of the report, it is intended not so much for experienced reviewers and editors but for those new to the job of indexing and storing condensed information so that it can be quickly recalled on demand for a general or specific literature search. Hopefully, the job descriptions and the fairly deep probings into certain aspects of the jobs will encourage thoughts leading to improved methods and viewpoints.

Part 1 of the report concerns the reviewer's duties, and Part 2 is for the editor. Each part, including the appendixes, consists of guidelines along with many comments and examples. Before going further, it may be well to consider the flow of work at the Center.

FLOW OF WORK AT NSIC

Briefly, the reviewers and the editor fit into the workings of the Nuclear Safety Information Center as follows:

1. Documents for review are selected by an information specialist, who routes them to appropriate reviewers, each a specialist in some aspect of nuclear safety.
2. Reviewers then skim or scan the reports, journal articles, etc., making appropriate entries, including abstracts and keywords, on office forms called "green sheets". Other information centers at the Laboratory use other colors.
3. The reviewers then send the green sheets and documents back to the information specialist, who makes certain bibliographic indexing entries on the office forms.
4. The green sheets are then sent to the editor, who edits the entries and then sends the green sheets to typists who prepare typescripts from them. Part 2 of the report is principally for the editor.
5. The typescripts are then returned to the editor for post-editing, after which they are sent on to the computer center, where all the entries, including the abstracts, are transferred to magnetic tape for storage and retrieval.

6. The Center's information-retrieval specialist enters the picture when our subscribers submit questions about nuclear safety. He queries the computer, formulating his query in terms of our keywords and other indexing points so he can get print-outs of the corresponding abstracts. The print-outs are then mailed to the questioner.
7. Many subscribers to our information service receive bi-weekly collections of pertinent abstracts. These are called "SDI" cards (computer print-outs), an initialism meaning "selected dissemination of information." Each subscriber is assigned a category or keyword "profile" of his interests, and the querying is done automatically at the computer center.

This brief look at the flow of work at the Center is sufficient to show that the reviewers and the editor must cooperate rather well if they are to ensure that information is stored in retrievable fashion. In what follows, we hope to show how this is done, beginning with guidelines for the reviewer. (The gist of the reviewer's job is summarized in the comments and examples shown on pages 56 to 77.)

PART I. GUIDELINES FOR THE REVIEWER

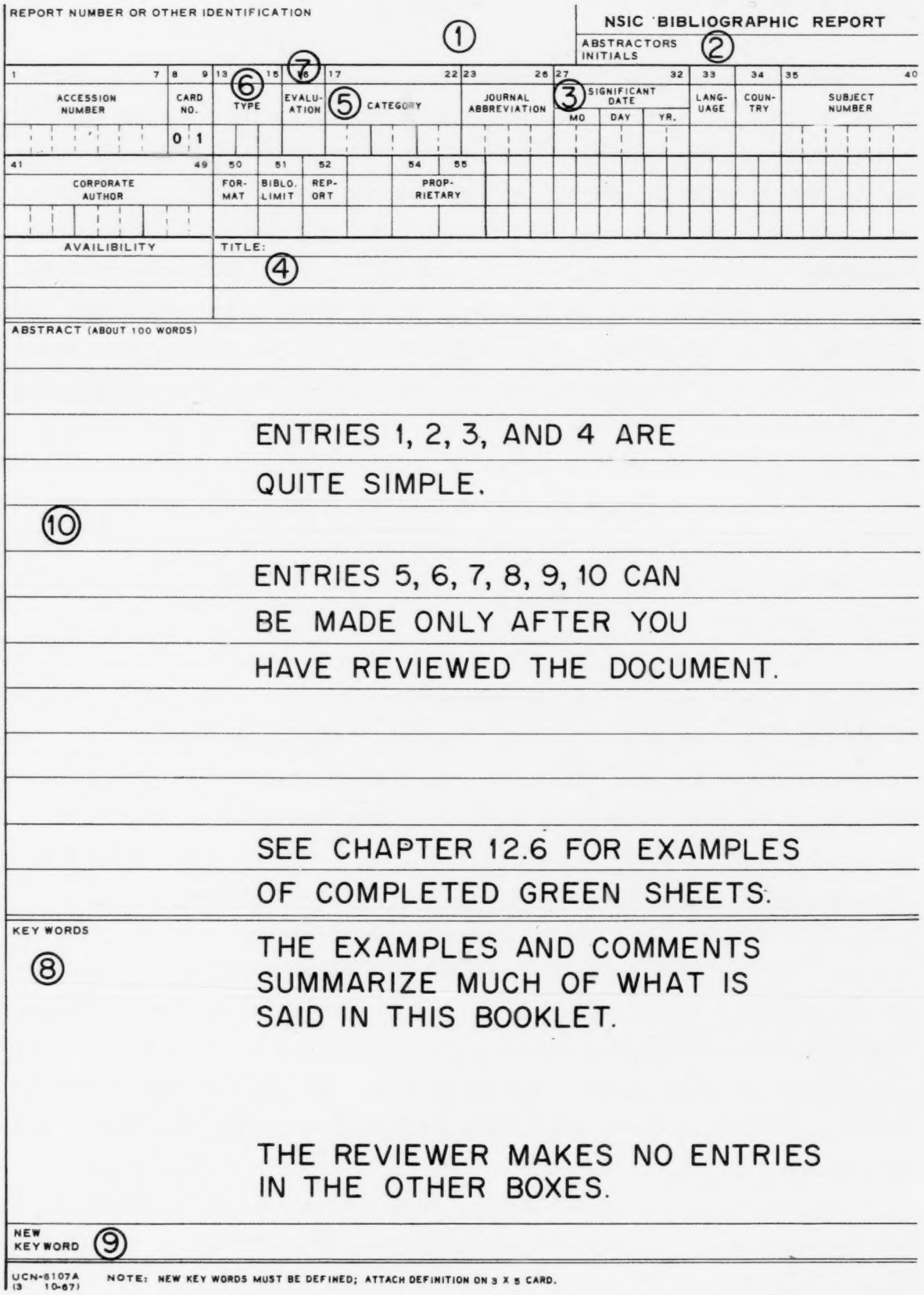
1. ORIENTATION

Ever since someone took hammer and chisel in hand and pounded a message into living rock, we have been bombarding one another with facts and practical ideas or with what purport to be facts and useful ideas. As the bombardment increased, attempts were made to sift, categorize, evaluate, and condense the information into abstracts. Rather narrow specialists, including editors, have done the work, but computerized information centers require the services of broad-gage reviewers. The reviewer, also called an abstracter-indexer, is not only a specialist in some branch of engineering or science, but he is also a purposeful reader (skims and, or, scans documents for intellectual content), a copyist (uses original abstracts), a deleter (removes superfluous matter from abstracts), a writer (prepares his own abstracts), an indexer (tags the information with keywords and other index markers to facilitate storage and retrieval), and a judge (evaluates the technical worth of the information).

We do not know whether the reviewer represents the ultimate in these attempts to aid the literature searcher, but it is clear that his contributions are valuable, largely because of the scope of his job. The reviewer is the key man at the Nuclear Safety Information Center because his job is to lead literature searchers to meaningful abstracts of documents pertaining to nuclear safety. All that he does converges finally on the abstracts that are stored at the computer center.

According to the brief description given above (copyist, deleter, writer, indexer, and judge), you have five basic problems to cope with in seeing to it that meaningful abstracts of nuclear-safety information are tagged so they can be stored in the computer, ready for recall by our literature retrievers. The purpose of this part of the report is to help you handle these problems reasonably well from the start, thus shortening your apprenticeship.

In conveying this job-handling information, which is aimed finally at cooperation with those who subscribe to our information services, it seemed best to key it to the entries that you will make on the "green sheets" (see page 8). As noted before, the green sheets are the reviewer's office forms, from which typescripts are prepared for transmittal to the computer center.



REPORT NUMBER OR OTHER IDENTIFICATION ①

NSIC BIBLIOGRAPHIC REPORT

ABSTRACTORS INITIALS ②

1–7	8–9	13–15	16	17–22	23–26	27–32			33	34	35–40
ACCESSION NUMBER	CARD NO.	⑥ TYPE	⑦ EVALUATION	⑤ CATEGORY	JOURNAL ABBREVIATION	③ SIGNIFICANT DATE			LANGUAGE	COUNTRY	SUBJECT NUMBER
						MO	DAY	YR.			
	0 1										

41–49	50	51	52		54–55
CORPORATE AUTHOR	FORMAT	BIBLO. LIMIT	REPORT		PROPRIETARY

AVAILIBILITY

TITLE: ④

ABSTRACT (ABOUT 100 WORDS)

ENTRIES 1, 2, 3, AND 4 ARE
QUITE SIMPLE.

⑩

ENTRIES 5, 6, 7, 8, 9, 10 CAN
BE MADE ONLY AFTER YOU
HAVE REVIEWED THE DOCUMENT.

SEE CHAPTER 12.6 FOR EXAMPLES
OF COMPLETED GREEN SHEETS.

KEY WORDS ⑧

THE EXAMPLES AND COMMENTS
SUMMARIZE MUCH OF WHAT IS
SAID IN THIS BOOKLET.

THE REVIEWER MAKES NO ENTRIES
IN THE OTHER BOXES.

NEW KEYWORD ⑨

UCN-6107A
(3 10-67)

NOTE: NEW KEY WORDS MUST BE DEFINED; ATTACH DEFINITION ON 3 X 5 CARD.

A brief inspection of the reviewer's entries on the green sheets will show that the first four are "look-do" items, requiring only a brief look at the documents sent to you. The remaining ones can be classified as "think-do" entries, meaning that the document must be reviewed before such entries can be made. For making these entries, only guidelines can be offered, a fact recognized when the title for this report was selected.

The outline below gives a good idea of what follows in this part of the report:

simple entries on the green sheets (review not essential in making these entries)
how to review a document systematically
how to decide categories of information
how to decide the type of document and type of information in it
how to evaluate the technical worth of a document
how to select keywords from the thesaurus (main-thurst, modifier, generic keywords)
brief look at information retrieval
why your keywords must exactly match those in the thesaurus
how to request that a keyword be altered
how to suggest a cross reference to a keyword
hints on shortening original abstracts and preparing your own
some common flaws in writing style
the imperative need for legible writing or printing

For your convenience, words denoting important points are underlines, and other important topics are presented in numbered or unnumbered paragraphs, centered on the page.

2. SIMPLE PROCEDURAL ENTRIES ON THE GREEN SHEETS: THESE CAN BE MADE BEFORE REVIEWING THE DOCUMENT

A few of the entries on the green sheets are merely look-do items (entries 1, 2, 3, and 4), such as transcribing the number of a report or the name of a book. While it is not the intention here to suggest a "hup, two, three, four" approach to reviewing, these simple entries might best be handled first because some of them hold clues to the entries that require contemplation and judgment - the think-do entries. For example, the mere act of writing the title of a report or conference paper may focus attention on the essence of the document, thus providing good clues to important keywords. And since you will also evaluate the technical worth of documents, entering the date of a document on the green sheet may arouse suspicion about the present value of the work - whether it might have been superseded by better information. This is not to say that all the pearls of wisdom were discovered last week, but it is to say that the date of a report has an implication other than chronological.

Now to the indexing entries themselves and how to handle them:

1. In the report number box on the green sheet (entry 1) make one of the following entries to identify the document:
   (a) For reports, enter the number - ORNL-2619, WAPD-925, etc.
   (b) For journal articles, transactions, and symposium papers, enter the full name of the journal, etc., plus the volume, the volume number, the page number(s), and the date.
2. In the Abstracter's Initials box (entry 2), enter your initials and the date of your review.
3. In the Significant Date box, enter the date of issuance of the document: 01 12 66 for January 12, 1966, for example. Not all documents carry a complete issue date - month, day, year. Enter whatever you find, even if only the year.
4. In the Title box (entry 4), enter the title of the document, for example, the title of the journal article, book, or report. If the document (a letter, for example) has no title, coin a meaningful one.

Since the remainder of your computer-input entries depend on your having reviewed the document, the next section tells how to review it quickly, make sense of it, thus arrive at good decisions concerning the entries that require more thought. Many documents will yield to our variety of speed reading.

3. HOW TO REVIEW (GET THE SUBSTANCE OF) A DOCUMENT BY SKIMMING AND SCANNING

To determine the main thrust of the majority of documents, you do not have to rely on wall-to-wall reading. Skimming, and when necessary, scanning (probing a little deeper), will turn the trick except for some of the documents in Categories 17 and 18 (question-and-answer reports, for example). Skimming and scanning represent nothing more than reading by location: title, abstract, table of contents (or main and subordinate headings), and conclusions when skimming; and lead paragraphs and topic sentences when scanning.

The purpose of this chapter is to (1) sort our and discuss the elements of reading by location and show how they are in accord with the principle of emphasis by location used by functional expositors (report writers, for example) and (2) give you an idea of how to integrate the elements when "speed reading" everything from research reports to AEC news releases about nuclear safety. It may be useful to start with three reference points:

1. Ordinarily, you can determine the problem(P), how it was solved or approached(S), the key results(R), and the chief conclusion(C) by reading only the Title, Abstract, Contents page, and Conclusions in the document. Titles are often meaningful. To read only the above parts of a report is to skim, looking for the PSRC components.

   In formally organized reports about research or research and development, the abstract, contents page, etc., sections are plainly labeled. In documents not so well organized - whatever the subject - the writer will still be dealing with a Problem, Solution, Results, and Conclusions (PSRC). The problem and all the rest of it may represent a real and present situation or a projected one.

2. The rules of functional exposition work in your favor, among other things, they tell the writer to proceed according to the concentration-to-expansion principle of exposition, where he should make his condensed, generalized statements in the abstract or summary and then make the extended, more detailed statements in the remainder of the report, collecting his chief and subsidiary conclusions under a plainly labeled heading. Most writers have good expository style; some will frustrate you.

3. The rules of composition work in your favor also. They call for a lead paragraph under each heading, to be followed by paragraphs that develop the lead. And so for the lead or topic sentences in a paragraph: they also must lead and focus the reader. So, items 1 and 2 help you skim, while item 3 helps you scan, which is necessary when skimming is unproductive. Most writers observe the rules of composition.

Having established that the rules of composition and functional exposition are intended to help readers locate key facts and ideas, and that most writers keep their readers in mind, let us look at skimming and scanning in terms of five common types of documents: topical reports, journal articles, conference papers, and contributions to symposia and transactions. PSRC, emphasis by location in certain parts of the document, and good adherence to the rules of composition will be found in many of these documents because they are what might be called "prestige" papers, in which the writers tried harder to communicate clearly, smoothly, and concisely. The instructions which follow will give you a good idea of how to review documents systematically and quickly, informing yourself well enough to handle those entries on the green sheet that require thought.

Effective Method for Skimming and Scanning Topical Reports, Journal Articles, Conference Papers, Etc.

Skim by Reading the Following Parts	If Skimming is Unproductive, Scan by Reading the Following Parts
1. Title (which should represent the main thrust of the document)	1. Introduction (if short, read the whole thing; if long, read any paragraph relating to P,S,R,orC)
2. Abstract (which should provide the essence of the problem, solution, results, conclusions)	2. Lead paragraphs under the main and subordinate headings, looking for clues to PSRC
3. Conclusions (usually put at the end of the report)	3. Lead (topic) sentences in each paragraph, with a view to PSRC; read the remainder of the paragraph when necessary
4. Table of Contents (if missing, read the main and subordinate headings)	

Prestige papers usually have a standard organization: title, abstract, introduction, body or report, and conclusions. Usually, they will be quickly understandable, thus adaptable to skimming. Of course, sometimes you will have to skim and scan. Only rarely will you get a document so poorly written that it leaves you glassy eyed, with your senses floating in pale regions of total intellectual stupor. Reject such documents if the Assistant Director of NSIC agrees.

Next, progress reports. These are what might be called the suspense stories of science and technology. They are usually collections of brief reports that attempt to show how the R&D labor is divided and how the work of each group is converging on the solution to some large problem which has been divided into a number of small ones.

The system outlined above for reviewing five of the prominent kinds of reports handled here is fairly useful when you review a progress report, but it must be pointed out that emphasis by location is often lacking, as are other aspects of good expository style. All have a title; few have either an overall abstract or specific ones related to individual sections; also conclusions sections are usually absent. In other words, the PSRC information is often hard to spot.

How then should you review them? Except for the few that we follow closely and therefore try or scan in the usual way, most of the information can be obtained from the title and the table of contents. From these two parts, you will usually get enough information to prepare a descriptive abstract (abstracts are explained in Chapter 11) and decide the categories and keywords (subjects taken up in Chapters 4 and 7).

Progress reports have their uses, but such reports are intended for a special and usually small audience made up of people quite interested in the chronological account of the false starts and of the useful ones that help describe and solve the problem. Progress reports set forth incomplete work and tentative, sometimes partly speculative, conclusions. The conclusions are sometimes withdrawn or modified as the work proceeds. For this reason alone, such reports have a short half-life and are sometimes regarded as the ephemera of technical literature. They are the ancestors of the journal articles (success stories), for example, that ensue after the work has been completed and soundly evaluated.

Generally, one should not expect too much from progress reports,which is why we concentrate on only the few that impinge sharply on certain aspects of nuclear safety.

So far, you have seen that the three reference points mentioned earlier can be useful in helping you collect your wits and review with system and purpose. This is because we have been dealing with documents in which PSRC and fairly standard format predominate, although the writers of prestige papers will usually be better expositors than the writers of progress reports. It must be recalled, however, that we are dealing here with guidelines for speed reading, not a detailed method for keeping up with all the twists and turns that an individual writer may take, especially if he is new at the game and does not follow the concentration-to-expansion principle of exposition. To the general approach given here, you will add much that you gain through experience and through discussions with other reviewers. Next, books.

Books interest us to the extent that they have a:

Title
Preface
Foreword (not in some books)
Contents page(s)

In reviewing a book, it is not necessary to read beyond the four parts mentioned above to get a fairly good idea of what the book is all about, how it differs from others of its class, and thus why it might be more useful.

Books, like prestige papers are also written according to the concentration-to-expansion principle. You will also find good emphasis by location. The title will often be a highly concentrated rendering of the main thrust of the book. If there is a foreword, you can usually expect to find that some objective friend of the author will have singled out some essential feature that makes the book a standout. Nearly all books have a preface (sometimes also called a foreword), where the author will have stated the objective(s) of the book, the basic viewpoint(s) upon which the book rests and from which each chapter can be inferred, the intent of each chapter or group of chapters, and the background required of the reader.

If it is a textbook the teacher may be shown several other chapter sequences that might be used, which chapters can be eliminated to make a short course, which questions (end of chapter) should be stressed maybe all the even-numbered ones), etc. The contents page may include even third-order headings, making even that page quite informative and highly suggestive of what the book is all about.

When you write the abstract for a book, you might want to write a descriptive abstract (an introductory sentence telling whether the book is a survey type, for example, or an advanced treatise, this to be followed by a list of the chapter titles). Maybe you would want to go beyond the descriptive abstract, making it more informative. This can be done by including a sentence or two concerning the viewpoint from which the book was written. Chapter 11 tells you about abstracts, where you will also learn that we prefer short ones, but meaningful (shorter than 100 words when possible, although we will accept 125 words in exceptional cases).

Question-and-Answer Regulatory Documents: Since Q-and-A reports (questions by AEC, answers by prospective licensees) are harder to handle than those characterized by ordinary expository style, only two or three reviewers get such documents so they can develop proficiency in preparing abstracts and deciding keywords, evaluations, and categories. Also, Q-and-A documents often cover nearly all categories of nuclear-safety information.

We review other kinds of documents, such as trip reports, accident reports, environmental-survey reports, news releases, patents, theses, etc. All may be reviewed by extrapolating and interpolating from the pointers given above.

Summarizing, many of the documents that you review can be handled rather easily when you read by location, which bears a strong relationship to the writer's emphasizing by location. Some writers may puzzle you if their expository style is poor, but the majority will let you decide entries for the green sheets rather quickly. Also, the new reviewer is invited to accelerate his apprenticeship through discussions with experienced reviewers and the editor.

In the next chapter, we discuss how to decide the category or categories of nuclear-safety information represented by a document.

4. HOW TO DECIDE CATEGORIES OF NUCLEAR-SAFETY INFORMATION

This chapter lists the categories of information and tells how to decide the alphabetical entries on the green sheets. The indexing of nuclear-safety information according to category (General Safety Criteria, Plant Safety Features, etc.) represents the coarse screening of information on the documents. It helps the literature retrievers at this Center to make general searches of our abstracts of the literature. Indeed, many literature searches here, including the Selective-Dissemination-of-Information searches, are searches by category only - coarse-screen searches. Also, if our information retrievers cannot find the answer to a question through a search based on keywords (fine screening of the information), they can always fall back on a search according to categories. This means that they will get more "false drops" (unwanted references), of course. Very often your decisions about categories will be easy to make, as will be shown.

The chief category is often easy to decide, even before reviewing the document. This is so because the documents are routed to the reviewer according to his specialty. Now and then, you will get one intended for someone else, and you should reroute it to that particular specialist.

The assignment of subsidiary categories requires that the document be reviewed and depends largely on two things: rhetorical proportion (how much space did the writer assign to a topic that bears on a related category?), and your own sense of proportion respecting the significance of crossovers not clearly indicated by rhetorical proportion. You will often find inter-disciplinary information in documents, and if a writer has devoted a section or subsection to such a crossover, rhetorical proportion alone indicates that you should note a second category in the category box on the green sheet. Sometimes you will have to note a third.

Decisions made through rhetorical proportion are simple enough: the table of contents or the headings and subheadings will give you good clues. When these are lacking from a document, rely on the impression that you get from the title, abstract, or the conclusions. This is not to say that every document will contain significant crossovers and hence that every one will call for more than one entry in the Category box on the green sheet. Rather, it is to say that you should be aware of the possibility. The 19 categories of nuclear-safety information are described next. You would be well advised to discuss the scope of your category with the Assistant Director of the Nuclear Safety Information Center.

Category No.	Name of Category and Description
1	General Safety Criteria. Encompasses all safety aspects of radiation policy, standards, codes, economics of safety, financial liability, and insurance. Other items of interest include setting the acceptable risk to public health and safety from nuclear and non-nuclear hazards, including criticality safety. Thermal pollution is also Category-1 information.
2	Siting of Nuclear Facilities. Encompasses factors used in evaluating sites, such as design characteristics and proposed operation of the facility, population density, use to which the environs are put (residential, farming, industrial, etc.), physical characteristics of the site, risk of earthquakes, and the relation between the engineered safeguards and the site.
3	Transportation and Handling of Radioactive Materials. Refers to shipping containers (for new or spent fuel, radioactive waste, etc.) shipping regulations, accidents during transport, criticality safety of the containers, heat-transfer capability, shock and fire resistance, etc.
4	Aerospace Safety. Covers safety considerations such as launch and re-entry problems unique to the nuclear systems used in aerospace vehicles.
5	Accident Analysis. Includes all facets of the analysis of postulated accidents (but primarily the thermal and hydraulic effects): burnout heat flux, critical heat transfer, reliability analysis, in-pile experiments, buildup of radiation emitters in the coolant, pipe rupture, and experiments, such as those conducted in LOFT (Loss-of-Fluid Test). Some accident-analysis reports may also contain experimental or theoretical work on reactor kinetics. If so, we have another place to pigeonhole the document: Category 6.

Category No.	Name of Category and Description
6	Reactor Transients, Kinetics, and Stability. Includes analytical and experimental studies. The transient behavior of reactors is studied in such special reactors as TREAT, PRR, and KEWB (S-RR).
7	Fission Product Release, Transport, and Removal. Includes the release of fission products from various materials and their movement within a containment system, which may be a real one or a scaled-down model. Transport and removal of the fission products includes their physical and chemical characterization and various mechanisms such as deposition, adsorption, fallout, filtration, etc., which help remove them from the containment atmosphere.
8	Sources of Energy Release Under Accident Conditions. The sources of energy include nuclear, Wigner, and gamma energies, as well as energy from chemical reactions and any other types of energy that might be released as a consequence of a nuclear accident. Most of the reports deal with postulated accidents or with related experiments.
9	Nuclear Instrumentation, Control, and Safety Systems. Includes the design of control and safety systems for various nuclear processes, as well as the required instruments and other hardware. The reports will deal largely with the performance required of safety systems; instrument specifications; the concepts of coincidence, redundance, failure modes, and reliability; the adequacy of shutdown margins; design features of mechanical devices; and related subjects. Most of the reports are design reports.
10	Electrical Power Systems. Covers information related to routine and emergency supplies of electrical power to nuclear facilities.
11	Containment of Nuclear Facilities. Encompasses all aspects of the building for which containment is claimed for reactors, radiochemical plants, hot cells, etc., and will include such items as design considerations, leakage, penetrations (electrical, piping), structural integrity, and testing.
12	Plant Safety Features. Covers the safety aspects of maintenance and decontamination of reactor systems, refining mills, and fuel-fabrication and storage facilities. Also includes engineered safety features such as pressure- and temperature-reducing systems, air-

Category No.	Name of Category and Description
	cleaning systems, and core-spray and safety-injection systems, all designed to minimize the consequences of nuclear accidents in power reactors.
13	Radiochemical Plant Safety. Includes criticality and nuclear-safety information related specifically to radiochemical plants (fuel fabrication, fuel recovery, isotope separation, source manufacture, etc.). The information may impinge sharply on Category 17.
14	Radionuclide Release and Movement in the Environment. Includes all aspects of intentional or accidental release of radiation emitters to the environment. Encompasses the occurrence and movement of radionuclides; movement includes fallout, geological considerations, countermeasures, analytical techniques, hydrological considerations, and movement in soil and water. Covers also the management of radioactive waste, which includes transportation, treatment, ultimate disposal, and effluent control. The chance is good that a Category-14 document will contain information that bears significantly on Category 15, and vice versa. One clear way to tell is to note whether the writer has devoted a section or subsection to such information, which is why it is important to read the table of contents or the headings and subheadings in those documents that do not include a list of contents. Of course, the title or abstract may give good clues. The conclusions section is often useful.
15	Environmental Surveys, Monitoring, and Radiation Exposure of Man. Covers items related to environmental and personnel monitoring during routine and accidental releases of radioactive material, monitoring methods and techniques, dose measurement and calculation, determination of maximum permissible dose and concentration, and internal and external exposure to radionuclides. Sometimes bears on Category 14.
16	Meteorological Considerations. Includes not only diffusion and deposition of radioactive material near the earth's surface in connection with reactor operations but also the atmospheric transport and fallout in the troposphere and stratosphere as a result of nuclear-weapons tests. These considerations usually represent mathematical and experimental attempts to calculate (or derive equations to calculate) off-site doses following postulated releases of radioactive material. If genuine releases are involved, may also refer to Category 14 or 15 or both.

Category No.	Name of Category and Description
17	Operational Safety and Experience. Covers the safety aspects of operation at any kind of nuclear facility (reactor, fuel reprocessing plant, source-manufacturing plant, etc.) - all occurrences, large or small. Includes regulatory and inspection reports.
18	Safety Analysis and Design Reports. Includes reports by the designer and the AEC regulatory staff, largely legal and preoperational. Such reports have a good chance of being entered under another category, also. Also includes descriptions and specifications of reactors, not necessarily connected with regulations. Design reports may represent conceptual or feasibility designs. Cost studies or general economic evaluations are usually rejected.
19	Bibliographies. May consist of bibliographies of nuclear-safety topics or may be the bibliographies (not the customary reference lists) included in some topical reports, theses, etc.

To summarize categorization, the chief category is easy to decide, and your selection of the subsidiary one(s) depends largely on two things: rhetorical proportion (how much space did the writer allot to a subject that bears on related categories?) and your sense of proportion respecting the significance of crossovers not clearly indicated by rhetorical proportion. Also, if you think that the document sent to you had been misdirected and that it should be reviewed by another reviewer, send it on to him. Finally, know the scope of your own category(ies) very well, and develop a good "feel" for other categories so you can detect significant overlapping.

In the next chapter we consider how to decide the type of document and information under review.

5. HOW TO DECIDE THE TYPE OF DOCUMENT AND THE TYPE OF INFORMATION IN IT

Indexing according to type of document (journal article, for example) and type of information in it (theoretical exposition, for instance) should be seen as part of our spectral analysis of the safety information that finally gets onto the magnetic tapes at the Computer Center. Along with your other entries on the green sheets, they help resolve an otherwise badly smeared spectrum of nuclear-safety information. This is to say that when you index according to type of document and type of information in it, our literature retrievers can look for abstracts referring to journal articles only, excluding other kinds of documents.

Having reviewed the document, or sometimes just glanced at it, you will be able to make correct indexing entries in the "Type" box on the green sheet. The "type-casting" is indicated alphabetically (see following list), with the first letter representing the type of document, and the second letter (sometimes a third) indicating the type of information in it.

A bibliography, for example, requires only a single-letter designation. The same for progress reports, largely because progress reports and bibliographies represent too many kinds of information. However, an annual progress report may include a bibliography representing all the monthly and quarterly progress reports for the year. Such a progress report would call for a two-letter designation: one to indicate progress report, and one to indicate bibliography. Caution: do not confuse reference lists in ordinary documents with bibliographies. We say that the reference list in a journal article usually represents only a thin slice of the literature that the writer consulted - just enough to help him define and solve his particular problem. We also say that a bibliography represents a fairly thick slice of the literature, going beyond the requirements of the particular problem and supplying background information. Some writers make this same distinction, providing the reader with a reference list and a bibliography (sometimes called "literature survey" in a thesis).

As an example of a two-letter designation, consider a journal article, entirely theoretical in content. It calls for an O (journal article) and a C (theoretical exposition).

As an instance of a three-letter designation, consider a State-of-the-Art Review that contains sections on theory as well as sections on experimental work. Here, you would index as follows: D, C, S.

Now to the alphabetical designations and descriptions of types of documents and types of information in them:

Designations	Descriptions of Types of Documents and Types of Information in Them
A	Data Source. A collection of tabular and, or, graphical data, raw or evaluated. May be engineering data, fallout data, other types of ecological data, etc. May appear in a topical report, for example. If so, use two letters: N and A. Many of the numerical portraits seen at this center represent fallout measurements, ecological studies, and site monitoring. The collection may range from handbook or report size to a page or less in a document. We also see reactor specifications. The usual tabulated or graphical data used only to support the text in a document does not call for an A, but a reviewer may tag it for his own use if he happens to find a little data that he wants to use in a review article he is writing.
B	Bibliography. B is used for the usual bibliography or to denote the fact that a document contains one. The latter kind is not to be confused with the usual reference list in a report, although a short report with many references might also call for a B. For example, a 30-page topical report with 150 references might indicate that the writer didn't recognize the difference between a reference list and a bibliography (literature survey) and then mislabeled the bibliography. If you are doubtful (and it is sometimes not easy to decide because we speed-read the documents) enter both an N and a B in the Type box on the green sheet. (This kind does not come along very often, by the way.)
C	Theoretical Exposition. Denotes any document in which theory represents the main theme; may also be used to indicate that the writer included theory in a document in which a description of the experimental work dominated.
D	State-of-the-Art Review. Applies to extensive reviews. May be about theory, practice, laboratory apparatus, instruments, engineered safety features, etc. See T (below) for Progress Reviews, which differ from extensive ones in that the Progress Review is a concise updating. Use a second or third letter to indicate the type of information in the review (some reviews include theoretical as well as experimental work).

Designations	Descriptions of Types of Documents and Types of Information in Them
E	Primarily of Historical Importance. Refers to a document that traces the ancestry of a reactor, theory, etc. (chronological theme). The designation E also refers to documents which discuss a single technological or scientific landmark in the nuclear industry. Reject if no reference to nuclear safety is made.
F	Elementary, Nontechnical Discussion. We reject these unless they can serve as introductory material to very recent developments in nuclear safety or unless they represent "position" statements. Usually no second letter is needed.
G	Progress Report. A periodical document about a single subject or possibly several related ones. Intended for special audiences - AEC sponsors, contractors, others intimately connected with the work, etc. More or less a diary of work done to reach one or more major objectives; might be called time-and-effort-spent reports. The conclusions, if any, may be very tentative, as one would expect for uncompleted work. A single report may represent theoretical, laboratory, and pilot-plant work, plus economic evaluations, etc. Progress reports (except for annuals) are given a single-letter designation unless the reviewer wants to give it a second tag for his own purposes. Annual progress reports often call for a B (bibliography) because many of them include a very extensive reference list, representing a year's collection of pertinent documents. As noted above, progress reports represent the sometimes faltering but always chronologically ordered steps toward reaching some objective. Once the goal is reached, a topical report (completed work, soundly evaluated) is written; see N, below, for description of topicals.
H	Engineering Report. Some will be straightforward reports about large-scale work. Many will be about laboratory work intended to provide engineering data. Some will be conceptual-design reports; some will represent detailed design. Nearly all these will be reports issued by AEC contractors and National Laboratories. If the document is a journal article, use two letters: O and H; if a topical report, use N and H, etc.
I	Thesis. Self-explanatory, use other designation(s) as required.
J	Book. Self-explanatory. Use other designation(s) as required.

Designations	Descriptions of Types of Documents and Types of Information in Them
K	Patent. Self-explantory. Use other designation(s) as required.
L	Transactions. Includes the publications resulting from meetings and symposia. May cover theory and,or, application; single topic or several related ones. Need at least two letters: L plus the letter or letters to designate the type of information.
M	News Releases and Press Reports. Often concerned with regulatory information or a change of position; sometimes concerned with recent viewpoints or other news about some aspects of nuclear safety. One letter is sufficient. Reject any news that qualifies as scientific chit-chat only.
N	Topical Report. Any report about completed, soundly evaluated work is a topical report. Usually deals with a single subject, sometimes two or more related ones. A journal article is a topical report, for example. However, at NSIC, we say that "topical report" means a report issued by AEC contractors, National Laboratories, NASA, Naval Research and Development Laboratory, etc. This excludes anything issued by a technical society, for example, a journal article. If the topical report is an engineering report, we use a two-letter designation - N and H. A rough guess indicates that the bulk of our topicals are about laboratory experiments; for these, use N and S (see S, below, for what we mean by "description of experiment.") Some of the topicals will represent laboratory work in support of engineering work; these should be given three letters: N, H, and S. A few topical reports will be devoted entirely to theory; use N and C.
O	Journal Article. By strict definition these are also topical reports, but we identify them with an O to distinguish them from the N type. It helps resolve the bibliographic spectrum. Add other letters as required.
P	Movie Films. Self-explanatory. Add other letters as needed. The "films" that we review are actually descriptions of films.
Q	Licensing and Regulatory Material. Includes pre- and post-operational material. Use single letter only.

Designations	Descriptions of Types of Documents and Types of Information in Them
R	*Trip Report*. Self-explanatory. Single letter only.
S	*Description of Experiment*. If the experiment (laboratory or pilot plant, for example) is *described well enough to be reproduced*, we declare that the document contains a "description of experiment." In most documents, you will find an *indication* (general description of how the data was obtained, or how a product was made); this does not constitute a description of the experiment. In a thesis and in some topical reports, however, you may see adequate descriptions of experiments, which would call for an "S".
T	*Progress Review*. Applies to brief review articles such as those in *Nuclear Safety*, which summarize the most fruitful advances. Similar brief updatings sometimes appear in other journals. Use one or two other letters, as needed, to indicate the type of information in the review.

Summarizing, when you type-cast a document, keep two points in mind: *type of document*, *type of information in it*. Not many documents will call for only one entry on the "Type" box.

6. HOW TO EVALUATE THE TECHNICAL WORTH OF DOCUMENTS

Part of the computer input that goes on the green sheets consists of an alphabetical designation to represent the technical quality of documents. The grade is entered in the "Evaluation" box. The reviewer's responsibility for evaluating the worth of a contribution to the literature has lessened considerably since the early days of the Center, not because good evaluations are not useful but because there is not now enough time to judge all documents carefully. Besides, skimming and scanning do not work well for border-line cases. In fact, the reviewer may have time for closely evaluating only those articles that relate to a review article that he may be writing. So, we evaluate all documents but reserve the close evaluating for internal use only. Subscribers to our services do not see these evaluations on the computer print-outs. The evaluation scheme is shown on the next page.

Since the aim of this chapter is to help you evaluate a document with a fair degree of accuracy you may need a reminder about new themes in science and variations on old ones. A significant part of our function is the transfer of variations on old themes, not the transfer of world-shaking ideas, principles, laws, or other fundamental discoveries. Poor information is rejected but only after the reviewer consults with the Assistant Director. We rank the variations on the themes according to whether they are poor, good, better, or best; and we use alphabetical designations. We also transfer data, some already well established, some recently acquired by routine or special effort, some highly refined, but very little startlingly new. Here again we try to assign a pecking order. And so with questions and answers, speeches, press releases, etc.

Although we cannot now grade as carefully as before, we make some attempt (not obligatory) to help our subscribers recognize an outstandingly useful report. In addition to putting the grade in the Evaluation box, you might add the following, for example, to the abstract: "Author's viewpoint very useful." However, for a report in which you for example find a glaring inconsistency in the writer's hypothesis, you might add this to the abstract: "Writer's hypothesis inadequate." Caution: Don't throw brickbats or bouquets unless your aim is sharp. It may not be, considering that you do not study documents closely, and this is partly why the Center does not ask you to strive for close evaluations. Experience has shown that the great bulk of the reports will call for an X in the "Evaluation" box, indicating competent work by the writer of the document. Very few documents will call for comments in the abstract, considering that it is a bit chancey.

The guidelines for making quick judgments about the technical worth of a document are given below. The value may be represented by a W, X, Y, or Z, with W representing the lowest grade. Only a small percentage of the documents will get a W or a Z, as might be expected.

1. For investigational papers (experimental, theoretical, or both), which are characterized by the defining and solving of problems, did the author use:

Incorrect or poorly contrived extrapolations (wrong theory, violation of principles, poorly designed equipment, inadequate instruments, etc.); not many of these; reject if Assistant Director of NSIC agrees.	W
Customary extrapolations, indicating competency in proceeding secundum artem (according to the art); applies to bulk of technical reports.	X
Ingenious projections from theory, apparatus, or customary procedure to his particular case (extrapolated cleverly).	Y or Z

2. For data reports (numerical data to fill gaps in handbook tables, to test the predictability value of a hypothesis, to satisfy the needs of engineers on a particular job, to add to fallout records, etc.), did the writer obtain the data by:

Using incorrectly designed experiment, poor procedure, etc.; this happens, but you may not pick it up in your review; not many of these; reject if the Assistant Director of NSIC agrees.	W
Taking ordinary care (bulk of data reports).	X
Taking extraordinary care and using very good instruments to get highly accurate, highly precise results; this kind comes along occasionally.	Y or Z

3. Progress Reports. Give an X grade, even though it is understood that progress reports represent unfinished work, evaluated only as well as such work can be. Also, progress reports, because so many lean heavily on documenting the time and effort spent on the job, are often difficult to understand quickly unless you are part of the team or are taking special pains to follow the work.

4. Review articles. It is always safe to give an X. Skimming and scanning may not enable you to judge the writer's ability to sift and evaluate a great stack of technical documents and reduce it to a well-evaluated, well-written, well-integrated collection of facts, ideas, procedures, laws, principles of operation, etc. Still, assign a higher value if you think the document deserves it.

5. Questions and answers. Here, the approach is different from that for a report about investigational work, data collections, etc. One experienced reviewer tries to decide whether the reader would find something of interest, rather than whether the reader would be gathering material to help define or solve a problem or to write a state-of-the-art review. He grades the Q and A documents as follows:

Neither answered the question nor presented interesting information.	W
Familiar question and answer.	X
Interesting aspect of the problem or a fairly complete treatment of it.	Y
Thorough treatment of the problem or a significant change in analysis, policy, or equipment.	Z

Summarizing, grade the documents as well as you can after skimming and scanning them. Most papers can safely be given an X on the assumption that they would not have been widely distributed without a prior review by someone in the writer's organization. W, Y, and Z will be used less frequently than X because that is in the nature of things.

7. THE NSIC THESAURUS: HOW TO SELECT MAIN-IDEA, MODIFIER, AND REACTOR-GENERIC KEYWORDS; USE OF THE ASTERISK

The purpose of this chapter is to establish useful guidelines for selecting keywords from the thesaurus. The term "keyword" applies to single words and to phrases, such as COMPARISON, THEORY AND EXPERIENCE. Keywords represent the fine adjustments among the indexing entries that we use. They point most directly to pertinent abstracts, integrating documents whose intellectual content would otherwise be scattered, while indexing in terms of type of document and category of nuclear-safety information unscrambles the documents themselves but not the information in them. This makes keywording quite important because through their use our literature retrievers find answers to questions submitted by our subscribers.

If your keywording is sharp, our literature retrievers can search the computer storage files in terms of keywords, getting good handholds on abstracts that represent the relevant intellectual content of pertinent documents. If keywording is not sharp, they will have to search in terms of categories of information, getting many "false drops" (unwanted abstracts) from the computer, wasting time and money as they separate the wheat from the chaff.

Each reviewer gets two kinds of keyword lists from which to select keywords. One is in book form and also contains the cross references. The other, in chart form, is convenient to use because the keywords are grouped for easy location (reactor names and the names of chemical elements, for example, appear in separate colunns). This other list of keywords appears on a large, single sheet, with all the keywords on it but none of the cross reference, synonyms, or combinational keywords. (See Appendix C for more on the two forms of the thesaurus and how to use both to best advantage.)

Also, each reviewer gets a dictionary in which the keywords are defined. This dictionary will help you make fine distinctions between certain keywords, just as the ordinary desk dictionary helps us distinguish between "ensure," "insure," and "assure." Some of our keywords, like words in the common language, are a bit tricky, and you will find that you need to use the keyword dictionary now and then. For example, you may have to distinguish between these two keywords: MATHEMATICAL TREATMENT and MATHEMATICAL STUDY.

In selecting keywords, you will deal with three basic kinds: First, keywords that represent the subject - the main thrust [the central issue(s)] of the document. Place an asterisk before such words to give them added weight. Next, you will be concerned with modifier keywords, the ones that pertain to the main-thrust words. There is a third kind, the reactor-generic keywords - the kind that denote reactor types (REACTOR, BOILING WATER; REACTOR, TRAINING; etc.).

Placing an asterisk or star before the main-thrust words is done for two reasons. First, when the starred words are read in logical order, you will see that you have matched or sometimes bettered the original title of the document. For example, if there were a thesaurus for keywording this chapter, the central-issue words might be read like the following: *selection . . .*main-idea keywords . . .*modifier keywords . . . generic keywords . . .*asterisk. It reads a little like baby talk, which also lacks prepositions, adjectives, verbs, phrases, etc., but it conveys the subject or central issues of this chapter. The second reason for starring the central-issue words is that the information retriever may want to make a "weighted-word" literature search, where starred words carry more weight than the others.

What about modifier words? Well, continuing to keyword this chapter, let us search our imaginary thesaurus for modifier words: spelling/punctuation/number . . . number of words . . . governing principles . . . examples. These four keywords, plus the six starred words, adequately describe the chief and related facts and ideas in this chapter.

How many keywords should be use to describe the information in a document? Five or ten for the usual journal article, topical report, or other document of similar length. Use ten to twenty for an extensive document such as an annual progress report or a book, either of which may touch on many topics. For such documents, most of your keywords may have to be starred because you will need at least one to describe the information in each chapter. This may not leave you with many modifier words to select, so you will have to choose the most useful ones in terms of nuclear-safety information.

Summarizing, you can adequately index a document by keywords if your decisions are based on the following reference points: main-thrust keywords, modifier keywords, generic keywords, asterisk, five to ten, ten to twenty, and accuracy in spelling and punctuating.

In the following example of keywording a document (in this case, a journal article), we will begin with the title and look for clues to keywords, starrable or not. Then we will skim and also scan the document. (See Chapter 3 for skimming and scanning.) While we are at it, we will also evaluate the technical worth of the document.

First, the Title:

CALCULATION OF FISSION-PRODUCT GAS PRESSURES IN OPERATING
UO_2 FUEL ELEMENTS

Keywords indicated by the Title: PRESSURE, INTERNAL; FISSION PRODUCT, VOLATILE; URANIUM DIOXIDE; FUEL ELEMENT; MATHEMATICAL TREATMENT

These keywords seem to indicate what the report is all about, making them likely candidates for elevation to central-issue status. (Not all titles are as meaningful as this one.) The reviewer may star the words at once, but some write them on the left side of the green sheet to segregate them tentatively, which is what we will do here. Having decided fairly well that we have found some or maybe all the keywords most suggestive of the basic theme of the document, we can usually decide that the rest of the review will consist of identifying keywords that pertain to (modify) the central-issue words. In this example, we will not find any other central-issue word in the abstract or elsewhere.

Now to the Abstract:

> "A method was developed for calculating the fission-product gas pressure inside operating UO_2 fuel elements. The calculations are based on a model in which the hot center of the UO_2 pellet is assumed to flow plastically under stress, and the outer annulus is cracked. The calculated pressures are shown to be in reasonable agreement with experimental measurements of the gas pressure."

Keywords Indicated by the Abstract: PLASTICITY; HIGH TEMPERATURE; COMPARISON, THEORY AND EXPERIENCE

Next, the first paragraph in the Introduction. Here, we show just the topic sentence because the others in the paragraph developed the idea expressed in the lead sentence:

> "Although it is the pressure, not the amount, of released fission gases that could impair fuel element performance, very little work has been done on measuring the pressure inside a fuel element, while very much has been done on measuring and estimating the amounts of gas released."

Evaluation of Technical Worth: Since the report must be evaluated, and since it can sometimes be done before reading as far as the Conclusions section, let us evaluate this one. The writer makes it fairly clear that he is on the track of something out of the ordinary, and he also told us that his predicted and experimentally derived results jibed reasonably well (see Abstract, above). For having departed from the customary and succeeded fairly well, he deserves a Y grade (next to highest). If his predicted and experimentally derived values had agreed better than reasonably well, he would have got a Z in the Evaluation box on the green sheet.

Now let us glance at the headings and the lead paragraphs under them. Here, we will show only the headings in this example, but we have already seen the first sentence of the lead paragraph under the heading, "Introduction":

- Calculation of the Gas Pressure
  - Radial Expansion of the Fuel
  - Axial Expansion
  - Plenum Void
  - Other Sources of Void Volume
- Experimental Measurement of Gas Pressure
- Comparison of Calculated with Observed Pressures
- Prediction of Pressure During Irradiation
- Estimates of Potential Error
- Conclusions (read whole thing, not just first paragraph)
- Appendix

Keywords: No others to be extracted from the headings.

Finally, we settle on the words that represent the main thrust of the article: FUEL ELEMENT; URANIUM DIOXIDE; PRESSURE, INTERNAL; FISSION PRODUCT, VOLATILE; MATHEMATICAL TREATMENT. Then we star them. Let us now see what our collection of central-issue and modifier words look like (no generic words in this article):

Main-Thrust Words	Modifiers
*FUEL ELEMENT	EXPANSION
*URANIUM DIOXIDE	PLASTICITY
*PRESSURE, INTERNAL	HIGH TEMPERATURE
*FISSION PRODUCT, VOLATILE	COMPARISON, THEORY AND EXPERIENCE
*MATHEMATICAL TREATMENT	

There is another way to arrange keywords on the green sheet so you can force yourself to distinguish between central-issue words and modifiers; try printing or writing the main-thrust words first, leaving space between them for the modifiers. On the next four pages are examples and comments on the two approaches.

This reviewer likes to stack the keywords, beginning with what will more than likely be the "starred" ones - the keywords that represent the "thrust" of the document.

Here, the reviewer keyworded a speech. Notice that the starred words represent the specific message of the talk _much better_ than the title does. The author's title is an attention-getting "_field_" title - quite justifiable for the title of a talk that covers a lot of territory. On the other hand, the reviewer's starred keywords represent _particular subjects related to nuclear safety_. Often, your starred words will represent such improved titles. Many times the titles of documents will be so specific with respect to the real thrust that they will suggest every starred word that you will need.

The unstarred keywords (modifiers) pertain to ELECTRICAL CONDUCTION.

REPORT NUMBER OR OTHER IDENTIFICATION
SPEECH – ISA OAK RIDGE SECTION
227th MEETING

NSIC BIBLIOGRAPHIC REPORT

ABSTRACTORS INITIALS EWH 4/5/68

1 – 7 ACCESSION NUMBER	8 – 9 CARD NO.	13 – 15 TYPE	16 EVALUATION	17 – 22 CATEGORY	23 – 26 JOURNAL ABBREVIATION	27 – 32 SIGNIFICANT DATE MO	DAY	YR.	33 LANGUAGE	34 COUNTRY	35 – 40 SUBJECT NUMBER
24350	01	N	X	091712		04	03	68	E	A	

41 – 49 CORPORATE AUTHOR	50 FORMAT	51 BIBLO. LIMIT	52 REPORT	54 – 55 PROPRIETARY

AVAILIBILITY

TITLE:

INTRINSIC SAFETY – ITS PAST, ITS PRACTICE, ITS FUTURE

ABSTRACT (ABOUT 100 WORDS)

Intrinsic safety is an engineering application of knowledge about ignition. For any particular set of conditions a minimum amount of energy is needed to cause ignition. An intrinsically safe system is a system designed so that it will not release that minimum amount of energy. Determining whether a particular system is intrinsically safe is a three-step procedure – (1) Evaluate the mechanical design, (2) analyze the circuit to determine worst case conditions, (3) determine whether current or voltage exceeds permissible values under worst-case conditions.

KEY WORDS

* SAFETY PRINCIPLES AND PHILOSOPHY
* IGNITION
* ELECTRICAL CONDUCTION
* SAFETY EVALUATION
INSTRUMENT, COMPONENT
" , CURRENT
" , VOLTAGE

NEW KEYWORD

UCN-6107A (3 10-67) NOTE: NEW KEY WORDS MUST BE DEFINED; ATTACH DEFINITION ON 3 X 5 CARD.

This reviewer prefers to enter the keywords in outline form. He enters the starred words and leaves space between them for the modifier words.

Since the author's title was highly suggestive of the substance of the report, the reviewer had little trouble selecting keywords and then "starring" them so that the collection of such words represented the central issue or issues of the report.

The modifier words were decided after the reviewer finished skimming the document.

Notice that the reviewer did not prepare an abstract but told the secretary to use the original one. He may or may not have shortened it, depending on its length.

REPORT NUMBER OR OTHER IDENTIFICATION

Nukleonik, 9:259-67 (May 1967)

NSIC BIBLIOGRAPHIC REPORT

ABSTRACTORS INITIALS WGS 3/28/68

1-7	8-9	13-15	16	17-22	23-26	27-32			33	34	35-40
ACCESSION NUMBER	CARD NO.	TYPE	EVALUATION	CATEGORY	JOURNAL ABBREVIATION	SIGNIFICANT DATE			LANGUAGE	COUNTRY	SUBJECT NUMBER
						MO	DAY	YR.			
74190	01	0	X	12	NUKK	5		67	G	G	

41-49	50	51	52		54	55
CORPORATE AUTHOR	FORMAT	BIBLO. LIMIT	REPORT		PROPRIETARY	

AVAILABILITY

TITLE: Apparatus and Methods for Protection Against Radon and Its Decay Products in Mines

ABSTRACT (ABOUT 100 WORDS)

Use abstract

KEY WORDS

* Radiation Safety and Control
Filter
* Radiolytic Gas
Radon
Sampling
Air

* Monitor, Sampling
Equipment, General
Aerosol, Radioactive

NEW KEY WORD

UCN-6107A (3 10-67) NOTE: NEW KEY WORDS MUST BE DEFINED; ATTACH DEFINITION ON 3 X 5 CARD.

Summing up, keywording amounts to the following: Skim (or scan, if necessary) the document. Concentrate on the title, abstract, main and subordinate headings, and conclusions in reports. If necessary, probe deeper by reading lead paragraphs and topic sentences. Project from this approach when reviewing documents not so formally compartmentalized. Record your keywords in one of the two ways shown above, just to force yourself to stop and think about your selections. If you are in doubt about any of your keywords, even after you have consulted the dictionary, please talk to another reviewer about the problem, or call a literature retriever or the editor. You need not be alone with your perplexity. Others will be glad to help you keyword information so it can be recalled on demand.

Next, we will look at keywords not in terms of how to select them but in terms of accuracy in spelling, punctuation, etc.

8. WHEN KEYWORDING A DOCUMENT, BE SURE THAT YOUR KEYWORDS MATCH EXACTLY THOSE IN THE THESAURUS

Part of the gross national production of input errors at computerized information centers consists in the reviewer's futile attempts to get the computer to accept near misses in terms of keywords. To prevent such errors and unnecessary delays, be sure that the keywords you enter on the green sheets match exactly those in the thesaurus.

1. Do not abbreviate keywords.
2. Do not omit a comma from a keyword. For example, the computer will accept FILTER, FIBER. It will reject the keywords, however, if the comma is missing. Some of our keywords contain two commas.
3. Do not transpose words. While a certain expression may roll off the tongue easily, for example, "hypothetical accident," the genuine keyword is ACCIDENT, HYPOTHETICAL. Some keywords referring to a single concept, such as "accident," are grouped, not scattered through the thesaurus.
4. Spell all words as shown in the thesaurus. For example, PONTRYAGINS PRINCIPLE. Obviously, there should be an apostrophe before the "s", and you may be tempted to correct our spelling, but the printout typewriter at the computer center cannot handle apostrophes. This turns possessives into plurals but cannot be avoided.
5. Watch for singulars and plurals.

Your close attention to spelling keywords exactly as they appear in the thesaurus can save much time, energy, and money. It takes only a split second to make the mistake but many minutes to correct it once it reaches the computer center.

9. HOW TO SUBMIT A NEW KEYWORD AND ITS DEFINITION

When you decide that we need a new keyword, do the following:

1. Consult the master thesaurus to ascertain that we do not already have the word. You may find your proposed keyword cross-referenced to an existing keyword.

2. Ask yourself whether a combination of two keywords already in the thesaurus will suit the need. If so, submit your proposed word as a cross reference to the other two. For example, "Filter, plutonium" is entered in the thesaurus as a cross reference to FILTER and PLUTONIUM, two keywords already in the list. (See page F-3 of the book-type thesaurus for this example; the chart-type thesaurus - large single sheet - contains no cross references.)

3. If your proposed keyword represents a changing trend in terminology, but a trend that you want to record because you think that the term may be more widely used than the one already in the thesaurus, enter the newer terminology as a cross reference (synonym) to the keyword already in the thesaurus. This helps make the thesaurus multilingual without increasing the number of keywords. For example, "in-reactor experiment" may displace "in-pile experiment" because pile-type reactors are outmoded. Still, we prefer to keep IN PILE EXPERIMENT as a keyword so we can avoid correcting the early tapes. Reflecting trends in terminology, changing fashions in words, neologisms, and other terminological twists and turns by using cross references is very useful because it lets the thesaurus speak in many tongues while not actually extending the vocabulary.

4. Having dealt with items 1, 2, and 3 above, and having decided that you have a valid new keyword, enter the word on the green sheet, using the box labeled, "New Keywords."

5. Write the definition, preferably on a 3-x-5 card, and attach it to the green sheet with a paper clip. If your definition is not clear enough, the editor or another reviewer will be glad to help you prepare a better one. Also, indicate related keywords and keywords for which the new one might be mistaken.

As to the definitions, the following example and hints will help you in their preparation. Note the format, especially the fact that all keywords must be printed or typed in all capitals. Also, no keyword may contain more than 46 characters, including punctuation and the spaces between words.

> ACCIDENT ANALYSIS
>
> An analysis or discussion of a single postulated accident in a particular reactor or system. Generally assumes no control or safety action and follows the course of the accident to completion. Generally concentrates on engineering aspects. (Compare with HAZARDS ANALYSIS and SAFETY ANALYSIS.)

Here we have a definition that not only tells what is meant by the keyword but what is not meant, by indicating two other words with which ACCIDENT ANALYSIS is closely allied and for which it might be mistaken. Some of our keywords must be defined in terms of negations, while others can be defined in the usual straightforward way. Notice the emphasis line under the word "postulated". Do not overlook such typographical accentuation when it is needed in your definition. Such touches make our dictionary more useful. For more on keywords (criteria, denotations, and connotations), see Chapter 17.

10. HOW TO REQUEST THAT A KEYWORD BE ALTERED

If you think that a keyword should be altered to make it more meaningful, for example, or for any other good reason, submit the suggested change on a 3-x-5 card, with your justification. As an example of a useful alteration, a reviewer asked that HEAT CONDUCTION be changed to HEAT TRANSFER, CONDUCTION so it could be placed with the other HEAT TRANSFER, _______________ words. If your suggestion is accepted, be sure to enter the change in your thesaurus to remind yourself not to revert to a discarded habit.

11. SUGGESTIONS ON HOW TO HANDLE ABSTRACTS AND EXTRACTS

Generally speaking, the other entries on the green sheet may be seen as arrows pointing to the abstract or the extract (an abstract composed of excerpts from the documents). This is the condensed information that our subscribers are really looking for when they ask our literature retrievers to conduct a search of the storage files.

The aim of this chapter is to present a general rationale for handling abstracts and extracts, and the prominent items to be discussed are listed below:

1. Structure of your job with reference to handling abstracts (the author's or your own).
2. Description of the four basic kinds of abstracts that we use.
3. Criteria for meaningfulness.
4. How to shorten original abstracts.
5. Two writing styles for the ones that you prepare.
6. How to save words by rhetorically fusing the title and the abstract.
7. How to prepare extracts.

Examples of abstracts and one extract, along with comments, are also provided to illustrate key points.

In Appendix A, reviewers who work with documents in Categories 17 and 18 will find the special ways their abstracts must be handled, especially with reference to format and meaningfulness. Mostly, these reviewers work with documents that deal with questions and answers, monthly operating reports, etc., not with the usual kind of report. While the special cases are presented in an Appendix, it must be remembered that some of the rationale presented here can be appended to what it said there.

The structure of your job with reference to abstracts is simple enough: copier, deleter, preparer. Your skill in handling abstracts, especially those that you shorten and those that you write, will help restore to at least a small segment of scientists and engineers their lost sense of relatedness to developments in the field of nuclear safety.

As copyist, you will merely indicate on the green sheet that the author's abstract be transcribed onto the typescript of the green sheet. Many will be copied as is because they will not exceed our upper limit on the number of words that may be used.

As deleter, you will need to know how to blue-pencil wisely so you can limit the abstract to 100 words or less (125 in exceptional cases) without sacrificing meaning.

As a preparer of abstracts, you will need to know something about their literary framework so you can provide our subscribers with abstracts that are good tests of the relevance of the original documents. You will need to know about the four kinds of abstracts - informative, indicative, descriptive, and indicative/descriptive. And you will want to hold some strong opinions against un-English sentences and verbal overkill (see Chapter 13 for these subjects).

Possibly the most important problem that you will have to solve when dealing with abstracts is that of meaningfulness and how it relates to the literary framework of abstracts. This problem will arise whether you are reading them, shortening them, or preparing your own. It applies also to the preparation of extracts. We say that an abstract is meaningful when the writer:

1. clearly indicates or adequately implies the problem (real or hypothetical),
2. indicates or implies the solution or approach (actual or proposed),
3. provides a few key results (actual or predicted), and
4. supplies the chief conclusion(s) (statement that the problem was/wasn't or can/can't be satisfactorily solved.)

According to our viewpoint, the above four items, in 0-2-3-4 order, represent the literary framework of an abstract and the logical framework of science and engineering. This is not an idealization because some of the abstracts that you will encounter will follow that pattern quite faithfully, especially reports about investigational work. Also, a little reflection will show that even an AEC press release about nuclear safety relates to those four corner posts, whether the release is about an accomplished fact or a projected one. Even an abstract about a collection of nomographs need not be an exception to the pattern. However, you will not always see the complete pattern in the originals that you ask the secretary to transcribe, nor will you always be able to prepare such abstracts. For those that you prepare, try to include, at least, items 1 and 4 above.

Since you will have to shorten many original abstracts to make them fit on the computer printout cards, the fine art of deleting is discussed in some detail in the next section.

11.1 Supplemental Information in the Abstract: How much is Allowable?

Many documents contain abstracts that cannot be used in the as-received condition because they contain too much supporting information, making them run well over our limit of 100 words or so. You will have to decide what to delete, indicating on the green sheet that the secretary is to transcribe your deleted version onto the typescript that goes to the computer center.

To help you blue-pencil the author's abstract with a fair amount of confidence in your ability to delete wisely, some guidelines are presented below. Most of them apply to abstracts about investigational work, but the general ideas apply to abstracts or extracts of all types (accident reports, environmental surveys, question-and-answer documents, etc.).

1. Delete mathematical equations and "where" lists. Substitute the following: "Equation given". Ordinarily, authors omit equations from their abstracts, following general practice.

2. Some authors include a short preface to the problem to put it in perspective. Such remarks may be deleted if you regard them as mere citings of the obvious.

3. If too many results (too much numerical data) are included to support the conclusion(s), delete some of them.

4. If the sense of the title is repeated in the abstract, delete that portion of the abstract when possible. For example, some writers start abstracts with a sentence that paraphrases the title, so your deleting such a sentence can often do more good than harm, leaving no gap in

the thoughts that the writer wanted to convey. Nevertheless, having deleted, re-read the title and your deleted form of the abstract to ensure that the new combination still makes the same sense that the author intended. In section 11.4, you will see an example of such a deletion.

5. The first four examples of what to delete are fairly straightforward, but this one has a few twists and turns that require you to think twice before deleting supplemental information. Here, you must rely on your ability to lean on your reader's knowledge of the subject. Mainly, it can be safely assumed that he is learned - that he has had at least four years of college and knows the terminology, basic postulates, theories, basic apparatus, and procedures from which he must extrapolate and interpolate to do his job. Accordingly, some supplementary information may be deleted on the basis that it is unessential commentary. However, some supplemental remarks may represent useful commentary, and you may have to rewrite some to shorten it, resulting in a brief but clear allusion to the point the author wanted to make. You will do much more deleting than allusive or or indicative rewriting, but it is well to be prepared for the infrequent event.

6. Now we come to the lengthy abstract of a report about some narrow specialty. Even the terminology is strange, consisting of borrowed or newly minted words whose meanings are still debatable among the 50 or so people interested in the specialty. This information center receives very few such reports. If one should come along, and if the abstract is too long, delete, but not with reckless abandon.

7. Never delete the statement of the problem or the chief conclusion(s). Delete some of the numerical results if author included too many. Delete details from description of experiments.

8. Delete information that trained scientists and engineers should be expected to know. This kind of information can be interpolated by our subscribers, who are professionals.

Summarizing, some deleting is purely mechanical, and some requires judgment. Once you gain confidence in your ability to delete systematically and wisely, you will have less trouble writing concisely when you prepare your own abstracts. Next, we will look at four common examples of abstracts to help you extrapolate to particular abstracts when reading, shortening, or writing abstracts.

11.2 Essay-Style Abstracts: Informative, Indicative, Descriptive, and Indicative/Descriptive

You will read or prepare four basic kinds of abstracts: informative, indicative, descriptive, and a hybrid - the indicative/descriptive. The first example below is that for an informative abstract about applied research. In the example, you will get a clear view of the problem, its solution, some key numerical results, and the conclusions called forth by those results. Many as-received abstracts about investigational work will tag all four bases, sometimes by clear implication, sometimes by clear statement, permitting you or any other interested reader to tell at once whether he is holding a high card. When you have to prepare an abstract, try to use that same four-part literary framework when possible. Admittedly, not all documents come equipped with meaningful abstracts, nor will you be able to prepare them for all the documents that do not already have them.

The example below (informative abstract, written in essay style) was typed as it would appear on a computer printout. Notice that paragraphs are indicated by three asterisks and that only periods, commas, hyphens, and parenthesis marks are used to punctuate. [See Appendix B for other style (conformity) points to be used by reviewers in their handwritten abstracts.]

Informative Abstract, Essay Style

> The problem was to develop a working model of a continuously operating furnace for sintering and reducing UO_3-ThO_2 for use in fuel elements. The equipment was developed and used successfully with natural oxides. Auxiliaries to facilitate remotely controlled operations with highly radioactive oxides were also developed. ***Basically, the apparatus consisted of an electrically heated vertical tube-furnace through which the oxides (very small lumps and fine powders) passed downward through an upflowing mixture of argon and hydrogen. *** The product met all specifications. Density, 10.0 g/cc. Ratio of oxygen to uranium, 2.01. Packed density (percentage of theoretical density after oxides had been packed into fuel tubes), 91%.

This original abstract had to be altered only slightly. For example, the punctuation was reduced to the use of commas, periods, and hyphens (one of the editor's duties), but nothing had to be deleted. Next, we will look at the above abstract written in indicative form. You will notice that the dilution of detail does not seriously affect meaningfulness.

Indicative Abstract, Essay Style

Indicative abstracts imply more than they express, as can be seen in the example below. They are less detailed than the informative type; even so, when they express or imply the problem and contain the evaluation of the work, the reader is helped to quickly decide whether the original document will be useful to him.

> A working model of a continuously operating electric furnace for sintering and reducing subdivided UO_3-ThO_2 was successfully developed. The reducing gas was a hydrogen-argon mixture. Auxiliaries for remotely controlled work with highly radioactive oxides were also developed and successfully tested. The products, UO_2-ThO_2, met all specifications for use in fuel elements.

You are permitted to convert an author's informative abstract into an indicative one, provided that you have the time and that you do not distort meaning. However, you are not asked to supply any of the missing corner posts (problem, solution, results, conclusions). To do so would be chancey, considering that you speed-read the documents. Many times, when preparing your own abstracts, you will decide in favor of the indicative abstract. Next, let us look at the above abstract in descriptive form. Here, you will see not only a dilution in detail but in basic information.

Descriptive Abstract, Essay Style

Descriptive abstracts do not tell much because they are little more than prose forms of the table of contents. They are structure-oriented, not very informative, stressing how contents of the document are organized and giving only hints about definite facts or ideas. They are useful for epitomizing progress reports, books, data collections and the like but are unsatisfactory summaries of topical reports, journal articles, or contributions to symposia.

You will receive a fair number of and copy many descriptive abstracts which will apply to progress reports. And you will also prepare them, mostly for progress reports that do not already have an abstract, and also for books and other documents.

Occasionally, you will encounter an author-written descriptive abstract for a topical report. You need not try to upgrade it to informative or indicative unless you have time and think that you can handle it.

To get an idea of how a descriptive abstract stresses the organization of a report but not much else, compare the following abstract with the two preceding ones. Notice that you cannot put your finger on the results, conclusions, or hardly anything else:

> Report describes a furnace for reducing and sintering fuel-element oxides. Also includes the procedure and other information.

As noted before, you will prepare descriptive abstracts for most progress reports (the ones we do not follow closely) and for books. For progress reports of interest, we prepare indicative-descriptive abstracts, which you may also prepared for books if you wish. Such an abstract for a book might tell how the book differs from others in its class, a fact that you can often find in the preface, where the author usually tells the viewpoint from which the book was written or how the book differs from others in some special way. The following example, taken from a reviewer-prepared book abstract, gives a good idea of how to compose a hybrid abstract which is not only structure-oriented but informative.

> This book presents data on personal hazards and safety, obtained from authentic and highly regarded sources. The writer's objective is to furnish the best guides to safety and hazards in biological, chemical, and radiochemical laboratories. Chapter titles are - General Protective Equipment, Ventilation, Fire Hazards, Chemical Reactions, Toxic Hazards, Electrical and Mechanical Hazards, Water Supply, Biological Hazards, Laboratory Design and Equipment, Tables of General Hazards Information.

You will rarely have to prepare an abstract for a topical report, journal article, or symposium paper because most of them come fully equipped. You may have to shorten the author's abstract, however.

So far, we have looked at abstracts written in the usual essay style. Next, we will consider the semitelegraphic style for writing them, a style that you might want to use.

11.3 Patterned Abstracts and Semitelegraphic Writing

Readers of abstracts like to have key facts and ideas pop right out at them, and here we will look at how you can help satisfy this yearning when you prepare your abstracts. Both examples below are characterized by a clipped delivery - semitelegraphic writing. Unimportant words are omitted, based on the idea that the reader can interpolate the missing words. Also, space limitations on the print-out cards limit our abstracts to only a few square inches, forcing us to think twice about the essay style of abstract.

This first example is representative of abstracts about research or research-and-development work. Notice that the mental indexing points are in parentheses. Many abstracts can be written according to this pattern and in this semitelegraphic style.

> (Problem) - Develop a working model of a continuously operating furnace for sintering and reducing UO_3-ThO_2 for use in fuel elements. ***(Solution, or Approach, if you prefer) - Built an apparatus consisting basically of an electrically heated tube-furnace, through which the oxides (chunks and powders) passed downward through an upflowing mixture of hydrogen and argon. Developed auxiliaries to facilitate remote operations when highly radioactive oxides are used. ***(Results) - Product met specifications. Density, 10.0 g/cc. Packed density (percentage of theoretical density after oxides had been packed into fuel tubes), 91%. Ratio of oxygen to uranium, 2.01. ***(Conclusions) Apparatus satisfactory. Product acceptable.

Now suppose you want to prepare a semitelegraphic indicative abstract for a rather complicated and extensive report but do not think that you can partition reality so neatly into four categories, possibly because to do so would result in too long an abstract. The following example may give you some clues about how to proceed. Notice that three of the four sentences start with verbs, giving the reader a sense of action and also helping to shorten the sentences. When the sense of the abstract is best served, start sentences with verbs. In English, the verb is not shy and retiring, as it is in German, and does not mind being near or at the beginning of a sentence. Watch verb tense, of course.

> Reviews effect of neutron irradiation on steels used in prestressed-concrete pressure vessel for an advanced gas-cooled reactor. The expected changes in properties are discussed in relation to design and performance of liner and prestressing tendons. Gives data from experimental irradiations. Concludes that irradiation effects on liner and tendons are not likely to lead to premature failure or to restrictions on operating conditions.

NSIC encourages but does not insist on such abstracts. We like them because they are concise and breezy and because we think that literature searchers, usually in a hurry, will appreciate the staccato delivery. Millions of abstracts are published annually (about 3.5 million last year), and the number increases 9% a year, compounded. These facts alone force two questions: should reviewers stick to the usually verbose essay style and continue to lead readers down the prim prose path? Or should reviewers write semitelegraphic abstracts, try harder to group facts and ideas logically, and thus help accelerate literature searches? Telegraphic writing - nine words and love - is not recommended; but, with practice you can develop a useful semitelegraphic style characterized by meaningfulness and brevity. Except for the clipped delivery, your sentences must be grammatical in all other respects.

Next, we will consider one more trick of the trade: saving words by rhetorically fusing the title and the abstract of a document. You can sometimes do this when you are shortening an abstract or when you are preparing one. The goal is conciseness without sacrificing meaningfulness.

11.4 When Possible, Use the Title of the Document to Eliminate Useless Repetition in the Abstract

With some documents, it is possible to shorten the abstract by rhetorically combining the title and the abstract. NSIC tries to get a lot of mileage out of 100 words or less (125 in exceptional cases), and here we present a useful way to do it. Suppose that you have a document in which the title is in essence repeated in the author's abstract. Delete that part of the abstract, as shown in the example below, where the literature searcher would be spared 21 unnecessary words.

Title	Spill of Radioactive Waste in Hot Cell at XYZ Fuel-Processing Plant, October 11, 1966
Abstract	~~On October 11, 1966, there was a spill of radioactive waste in a hot cell at the XYZ fuel Processing Plant~~. A chemical operator etc., etc., etc.

Deletions of the kind indicated above should not be overlooked, whether you are working with the original abstract or preparing your own. Admittedly, the trick works best with certain kinds of reports, such as accident reports. The above abstract refers to what we call an INCIDENT, NONREACTOR. Since we handle many such reports, you will be able to strike a few blows against useless repetition, which is not the same as repetition for emphasis. Note: Never alter the title of a document to make it suit the occasion.

11.5 The Extract (Abstract Made up of Parts Selected from Any Part of a Document)

The extract serves the same purpose as an abstract. Suppose that you are reviewing a document that does not have an abstract but that you think you can prepare one by lifting sentences from the document. If so, draw "blocks" around the parts that you want the secretary to transcribe onto the typescripts that are sent to the computer center. In the margin of the page or pages of the document, number the blocks so the secretary can type the excerpts in logical order Note: Block out the excerpts lightly and do the same for the numbering in the margin of the pages. Marked-up documents may not be returned to the library, so your markings will have to be erased after the typescript has been prepared.

We said that you may want to prepare an extract for documents that do not have an abstract. You may also prefer the extract when the author's abstract does not make enough sense. So, if your review turns up sentences that speak more plainly of the problem, approach, results, and conclusions, block them out for use as the extract. If you cannot find all four items in your quick review, settle for less.

This ends a rather lengthy discourse about two short literary products - the abstract and the extract. Next, we will look at some sample green sheets, showing how reviewers handle abstracts and other entries.

11.6 Examples of Green Sheets, Emphasizing Abstracts, Extracts, and Other Entries

The following actual examples of "green-sheeted" abstracts, extracts, and other entries, along with the comments, may help you summarize all that went before in this chapter and the others that preceded it. The comments and examples are shown on facing pages. Examples and comments about abstracts for documents in Categories 17 and 18 are given in computer printout form in Appendix A. Documents in these two categories - for example, safety-analysis reports and AEC questions, are different enough in format and content that it seemed best to discuss them in another part of the report.

BIBLIOGRAPHIC ENTRIES

These point in the general direction of the abstract

This section of the green sheets contains the bibliographic entries. Check-marks indicate the ones made by the reviewers. →

ABSTRACT

This is what our subscribers are after

The reviewer used the "problem-approach-results-conclusions" format, possibly the most interesting and useful partitioning of facts and ideas about any kind of research work. Good informative abstract.

Other key points:

The writing is legible, making it easy for our secretaries to transcribe.

The clipped and breezy sentences are quite understandable. →

The "spacers" (#) were added by the editor to remind the secretary to use the "space-hyphen-space" form of the colon (the "light" colon). The print-out machine at the computer center does not print colons, semicolons, question marks, or apostrophes, limiting our punctuation to commas, periods, and light colons.

The three "stars" indicate paragraphs. The print-out machine does not indicate paragraphs by indention; they are shown by three asterisks.

KEYWORDS

These point specifically to the abstract

Notice the carefully printed keywords. Errors in key-words or their transcription cost us time, money, and energy.

The "starred" keywords represent the main thrust of the document. →

The "unstarred" keywords modify or pertain to one or more of the starred words.

Collectively, the starred and unstarred keywords summarize the sense of the document.

REPORT NUMBER OR OTHER IDENTIFICATION
NAA-SR-Memo-3885 ✓

NSIC BIBLIOGRAPHIC REPORT

ABSTRACTORS INITIALS EWH 12/7/67 ✓

1–7 ACCESSION NUMBER	8–9 CARD NO.	13–15 TYPE	16 EVALUATION	17–22 CATEGORY	23–26 JOURNAL ABBREVIATION	27–32 SIGNIFICANT DATE MO	DAY	YR.	33 LANGUAGE	34 COUNTRY	35–40 SUBJECT NUMBER
20780	01	H	X	09		05	19	59	E	A	

41–49 CORPORATE AUTHOR	50 FORMAT	51 BIBLO. LIMIT	52 REPORT	54–55 PROPRIETARY

AVAILABILITY

TITLE:

SODIUM TEST OF SQUARE-EDGED ORIFICE FLOW METER

ABSTRACT (ABOUT 100 WORDS)

(Problem)#-# Evaluate a square-edged orifice flow meter for use in sodium systems. ***

(Approach)#-# Set up experiment and calibrate orifice flow meter using J-tube level indicators to measure the pressure differential across the orifice. ***

(Results and Conclusions)#-# Data recorded after 200 operating hours indicated no aging effects. Visual inspection after 400 hours of sodium operation (400 to 1000F) showed no eroding or pitting of the orifice edges. This test demonstrated the feasibility of using a square-edged orifice flow meter in sodium systems

KEY WORDS

* INSTRUMENT, FLOW
* TEST, INSTRUMENT RESPONSE
FLOW ORIFICE
EQUIPMENT DESIGN
* SODIUM

NEW KEY WORD

UCN-6107A (3 10-67) NOTE: NEW KEY WORDS MUST BE DEFINED; ATTACH DEFINITION ON 3 X 5 CARD.

The first example and accompanying comments (Pages 56 and 57) showed the gross anatomy of the green sheets (bibliographic entries, abstracts, and keywords), along with some of the applied anatomy (one kind of meaningful format for abstracts, the need for legibility, how we indicate paragraphs, etc.)

The examples and comments on this and the following pages pertain to applied anatomy with respect to abstracts, keywords, and certain of the bibliographic entries.

> Here we have an essay type of abstract. Notice that the problem, solution (or approach to the problem), results, and conclusions are either clearly implied or stated.
>
> When you prepare essay-type abstracts, do it from the "problem-solution-results-conclusions" viewpoint. However, if the document was written by a "Sunday driver", by someone who does not get to the point, you are not asked to read the document closely and then get to the point for him. You may then have to prepare a descriptive abstract, shown on Page 67, or an "extract", shown on Page 71.
>
> An informative or indicative abstract about investigational work should inform the reader about the:

☑ problem

☑ solution (or approach)

☑ results

☑ chief conclusion

If you cannot touch all the bases, settle for:

☑ problem

☑ chief conclusion

This check-the-block system for deciding what should be included in an abstract works especially well for research and R&D reports. It is not applicable to a description-of-equipment report, for example.

REPORT NUMBER OR OTHER IDENTIFICATION
POWER ENGINEERING 71 (11) P51

NSIC BIBLIOGRAPHIC REPORT

ABSTRACTORS INITIALS EWN 12/4/67

ACCESSION NUMBER	CARD NO.	TYPE	EVALU-ATION	CATEGORY	JOURNAL ABBREVIATION	SIGNIFICANT DATE MO	DAY	YR.	LANG-UAGE	COUN-TRY	SUBJECT NUMBER
20567	01	0	X	10				67	E	A	

CORPORATE AUTHOR	FOR-MAT	BIBLO. LIMIT	REP-ORT	PROP-RIETARY

AVAILIBILITY

TITLE: GENERATOR SET AVAILABILITY

ABSTRACT (ABOUT 100 WORDS)

In designing a power plant for high reliability, estimates of maintenance and spare-unit requirements must be quite accurate. The Monte Carlo technique is an effective method of simulating random equipment failures, and its cost is low. An example is presented for diesel-engine and gas-turbine prime movers.

KEY WORDS

* ELECTRIC POWER, AUXILIARY
* RELIABILITY ANALYSIS
* DESIGN CRITERIA
THEORETICAL INVESTIGATION
MONTE CARLO
GENERATOR, ENGINE
MAINTENANCE AND REPAIR

NEW KEYWORD

UCN-6107A
(3 10-67)

NOTE: NEW KEY WORDS MUST BE DEFINED; ATTACH DEFINITION ON 3 X 5 CARD.

1216

Here the reviewer used a Xerox copy of the author's abstract and shortened it. We like 100 words or less because of space limitations of the print-out cards.

The reviewer preferred to start the first sentence with a verb, which was a good idea because it puts action in the sentence at the outset.

But, was the first sentence really needed? No, because the title, which can often be rhetorically fused with the abstract, says more. The first sentence could have been deleted.

Much of your work will consist in copying and, or, shortening original abstracts. If you like, you may make a Xerox copy of the original, trim to size, and paste it on the green sheet.

When possible, fuse the title and abstract. Just be sure that the lead sentence in the abstract follows the title logically.

REPORT NUMBER OR OTHER IDENTIFICATION
AERE-R-5021

NSIC BIBLIOGRAPHIC REPORT

ABSTRACTORS INITIALS EWH 11/30/67

1–7 ACCESSION NUMBER	8–9 CARD NO.	13–15 TYPE	16 EVALUATION	17–22 CATEGORY	23–26 JOURNAL ABBREVIATION	27–32 SIGNIFICANT DATE MO	DAY	YR.	33 LANGUAGE	34 COUNTRY	35–40 SUBJECT NUMBER
70451	01	HC	X	09		05		67	E	U	

41–49 CORPORATE AUTHOR	50 FORMAT	51 BIBLO. LIMIT	52 REPORT	54–55 PROPRIETARY

AVAILABILITY

TITLE: CALCULATION OF NOISE/SIGNAL RATIO OF A NUCLEAR PULSE AMPLIFIER USING GATED ACTIVE INTEGRATION

ABSTRACT (ABOUT 100 WORDS)

PRESENTS A method ~~of~~ FOR calculating noise in pulse-amplifying systems, ~~such as those employed in [illegible] is presented~~. The method is a time-domain one and is thus specially suitable for cases where the pulse processing involves a mixture of analogue and digital techniques ~~(e.g. gating, active integration, etc.); [illegible] proposed in the recent literature~~. It also has positive advantages when applied to certain more conventional arrangements, for example those employing single or multiple delay-line shaping.

~~The detailed analysis given here is an example of its application to active integrator systems, as proposed by Kandiah.~~ Two types of integrator are analysed, in one of which the CR coupling time constant is switched. The latter system, with proper choice of parameters, yields a noise/signal ratio only 1.6% greater than the ideal cusp-response amplifier. Results are presented in the form of noise maps for each of five versions of the active integrator. ~~; for comparison the noise map of a conventional single-CR amplifier~~

KEY WORDS

* NOISE ANALYSIS
* INSTRUMENT, CAMPBELLING
THEORETICAL INVESTIGATION
INSTRUMENT, NUCLEAR
" , PULSE
" , AMPLIFIER
SPECTROMETRY, NEUTRON

NEW KEY WORD

UCN-6107A (3 10-67) NOTE: NEW KEY WORDS MUST BE DEFINED; ATTACH DEFINITION ON 3 X 5 CARD.

This abstract of a document about a computer code is reasonably good. The conclusion ("excellent agreement with . . .") is probably enough to encourage the interested reader to get the document.

Notice how well the title merges into the abstract.

The mixture of printing and cursive writing would represent a distraction for the secretary.

The following checklist will help you handle abstracts for computer codes, whether you are dealing with the author's or preparing an abstract for a document that does not have an abstract. The list will help you prepare your own, especially when you are in a hurry; it represents ideality which you will rarely achieve.

How Many of the Following Points Can You Make in 100 Words?

☑ Kind(s) of problem(s) solved

☑ What method (character of the mathematics) ? Is it "quick and dirty" or rigorous?

☑ Basic theory behind the code

☑ Kind of computer designed for

☑ Language (Fortran-4, -2, Algol, etc.)

☑ Size of storage memory

☑ Running time

☑ Degree of agreement between actual and calculated results

☑ Degree of agreement with similar codes

☑ Must user write additional subroutines?

☑ Contains (does not contain) example(s) of typical problems

REPORT NUMBER OR OTHER IDENTIFICATION

GEAP-5471

NSIC BIBLIOGRAPHIC REPORT

ABSTRACTORS INITIALS 3/4/68 CAM

1–7	8–9	13–15	16	17–22	23–26	27–32			33	34	35–40
ACCESSION NUMBER	CARD NO.	TYPE	EVALUATION	CATEGORY	JOURNAL ABBREVIATION	SIGNIFICANT DATE MO	DAY	YR.	LANGUAGE	COUNTRY	SUBJECT NUMBER
23787	01	HN	X	11		03		67	E	A	

41–49	50	51	52		54–55
CORPORATE AUTHOR	FORMAT	BIBLO. LIMIT	REPORT		PROPRIETARY

AVAILIBILITY

CFSTI

TITLE:

PAPA - STRUCTURAL ANALYSIS OF PLATES AND SHELLS, USING TRAPEZOIDAL AND TRIANGULAL PLATE ELEMENTS

ABSTRACT (ABOUT 100 WORDS)

PAPA IS A COMPUTER PROGRAM GIVING EXCELLENT AGREEMENT WITH CLASSICAL SOLUTIONS IN MOST CASES. ANALYSIS IS BASED ON PLATE-PANEL ELEMENTS, using intersecting beams connected at their center joint. POISSONS RATIO IS THEN INCORPORATED INTO THE ANALYSIS.

KEY WORDS

STRUCTURAL INTEGRITY
*STRESS ANALYSIS
*SHELL
*SLAB
MATHEMATICAL TREATMENT
ANALYTICAL MODEL
*COMPUTER PROGRAM

NEW KEYWORD

UCN-6107A
(3 10-67)

NOTE: NEW KEY WORDS MUST BE DEFINED; ATTACH DEFINITION ON 3 X 5 CARD.

Hybrid abstract (indicative/descriptive). Alluded to the procedures. Clearly indicates risk due to corrosion of ceramic container. Notes other topics in the document - design features and future developments.

Note legible printing - a boon to the secretaries and the editor.

Notice that some of the clipped sentences begin with nouns and some with verbs. Good "pacing" for the reader. This reviewer has a good feeling for the most useful type of lead-off word. Ordinarily, diversity of this kind is needed, while redundancy (all verbs, all nouns) may be required for quick comprehension of some abstracts. Well-chosen words help vitalize not only the abstract but the literature searchers.

This reviewer decides the central-issue keywords and then prints them, leaving plenty of space between for the modifier and genetic keywords. The result is a keyworded outline of the document. Very good system because it makes him stop and think about how well he is selecting keywords.

REPORT NUMBER OR OTHER IDENTIFICATION
RISO-150

NSIC BIBLIOGRAPHIC REPORT

ABSTRACTORS INITIALS WGS 2/28/68

1 7	8 9	13 15	16	17 22	23 26	27		32	33	34	35 40
ACCESSION NUMBER	CARD NO.	TYPE	EVALUATION	CATEGORY	JOURNAL ABBREVIATION	SIGNIFICANT DATE			LANGUAGE	COUNTRY	SUBJECT NUMBER
						MO	DAY	YR.			
27239	01	N	X	13		06		67	E	D	

41 49	50	51	52		54 55
CORPORATE AUTHOR	FORMAT	BIBLO. LIMIT	REPORT		PROPRIETARY

AVAILIBILITY	TITLE:
	Pilot-Plant Vitrification of Simulated Radioactive Waste

ABSTRACT (ABOUT 100 WORDS)

Discusses two pilot-plant procedures – discontinuous melting in a stainless-steel cylinder used for permanent storage, and continuous melting in a ceramic container. The glass is removed by continuous overflow and collected in steel cylinders for disposal. Corrosion of stainless steel no problem. Corrosion of ceramic material serious in the long term, according to present knowledge. Reviews design features and future development.

KEY WORDS

★ Radiochemical Plant Safety
Waste disposal, general
" " , liquid
Waste handling
Corrosion
★ Radiochemical Processing
Denmark

★ Waste Treatment, Fixation
Waste Treatment, Liquid
Glass

NEW KEYWORD

UCN-6107A
(3 10-67)

NOTE: NEW KEY WORDS MUST BE DEFINED; ATTACH DEFINITION ON 3 X 5 CARD.

Good descriptive abstract. The document was 242 pages long and had no abstract. Reviewer could not prepare an informative or indicative abstract so he wrote a highly condensed prose form of the table of contents.

Even though this abstract is a descriptive one, the reader gets a fair idea of the problem (stress analysis of nozzles subjected to external forces) and the approaches to a solution (nine theories).

No key results and no conclusions can be found in the abstract, but descriptive abstracts are not expected to be so informative.

This reviewer prefers to arrange his keywords in two columns, one for keywords that denote the main thrust of the document, and one for words that pertain to one or more of the starred words.

REPORT NUMBER OR OTHER IDENTIFICATION

TID-73343

NSIC BIBLIOGRAPHIC REPORT

ABSTRACTORS INITIALS 3/4/68 HW

1–7	8–9	13–15	16	17–22	23–26	27–32			33	34	35–40
ACCESSION NUMBER	CARD NO.	TYPE	EVALUATION	CATEGORY	JOURNAL ABBREVIATION	SIGNIFICANT DATE			LANGUAGE	COUNTRY	SUBJECT NUMBER
						MO	DAY	YR.			
	01	HN	X	11		07	15	66	E	A	

41–49	50	51	52		54–55
CORPORATE AUTHOR	FORMAT	BIBLO. LIMIT	REPORT		PROPRIETARY

AVAILIBILITY

TITLE: Stresses at Nozzles in Spherical Shells Loaded with Pressure, Moment, or Thrust

ABSTRACT (ABOUT 100 WORDS)

Gives nine theoretical approaches to stress analyses of nozzles subjected to external forces. Compares results of the theories, summarizes the experimentally derived data, and discusses results in relation to present codes and practices.

KEY WORDS

★ stress analysis
★ nozzle
★ sphere
★ shell

stress
pressure vessel
comparison, theory and experience

NEW KEYWORD

UCN-6107A (3 10-67) NOTE: NEW KEY WORDS MUST BE DEFINED; ATTACH DEFINITION ON 3 X 5 CARD.

When keywording, be sure to include, when possible, the keywords that denote the specific reactor, the generic word for the reactor, the kind of report, and the aspect of the analysis or treatment. Such keywords go a bit beyond the main-thrust and modifier keywords.

Notice what the first two kinds of keywords can do to help provide an almost pinpointed search of the computer tapes:

PILGRIM STATION (BWR) relates BRITTLE FRACTURE to a particular reactor

REACTOR, BWR relates BRITTLE FRACTURE to an entire class of reactors.

There are many specific-reactor words on the right side of the keyword chart, along with generic keywords. When you use them, the literature retriever is enabled to "zero" in on highly particularized information.

Notice that this reviewer used a keyword to denote a particular kind of report - REPORT, PSAR (preliminary safety analysis). This would help the literature retriever get all the information relating to a preliminary safety analysis of BRITTLE FRACTURE, eliminating all other information relating to the subject, such as might be found in progress reports, for example.

Then we have a fourth kind of keyword which you should use when possible: the kind that shows the aspect of the analysis or treatment in the document. MATHEMATICAL TREATMENT is such a word, as is DESIGN STUDY, SAFETY REVIEW, etc. Many keywords relating to kind of report and aspect of analysis or treatment have been set apart for you on the right side of the keyword chart.

REPORT NUMBER OR OTHER IDENTIFICATION

Letter to GT Seaborg, USAEC

NSIC BIBLIOGRAPHIC REPORT

ABSTRACTORS INITIALS 23 May 68 Gue

7	8 9	13 15	16	22	23 26	27		32	33	34	35 40
ACCESSION NUMBER	CARD NO.	TYPE	EVALU-ATION	CATEGORY	JOURNAL ABBREVIATION	SIGNIFICANT DATE MO	DAY	YR.	LANG-UAGE.	COUN-TRY	SUBJECT NUMBER
Docket	0 1	Q	Y	18		04	12	68	E	A	

50-293

41 49	50	51	52		54 55
CORPORATE AUTHOR	FOR-MAT	BIBLO. LIMIT	REP-ORT		PROP-RIETARY

AVAILIBILITY

TITLE: ACRS report on Pilgrim Station BWR

ABSTRACT (ABOUT 100 WORDS)

Briefly reviews safety related plant features (studies on water runup during coastal storms, past problem areas of large water reactors, design criterion 35, ECCS will keep clad from disintegrating on cooling). Applicant states further consideration to assure low pressure cooling capability prior t pressure relief. ACRS recommends Edison assume an active quality control role, and assure adequate offsite emergency plan prepared by Commonwealth of Mass.

KEY WORDS

ACRS

* Review

* Report, PSAR . . . KIND OF REPORT

Pilgrim Station (BWR) . . . SPECIFIC REACTOR

Reactor, BWR . . . GENERIC KEYWORD (TYPE OF REACTOR)

Brittle fracture

Radiological Assistance

Quality Control

NEW KEY WORD

UCN-6107A (3 10-67) NOTE: NEW KEY WORDS MUST BE DEFINED; ATTACH DEFINITION ON 3 X 5 CARD.

The Extract:
Excerpts from the Text of the Documents

Here the reviewer decided that the author's abstract represented an answer in search of a question, so to speak. So, to convey more meaningful communication to our subscribers, he blocked out and numbered two excerpts for the secretary so she could transcribe them in proper order into the typescript of the green sheet.

On the green sheets, you will often indicate that you want an extract, maybe because the document does not have an abstract or because the abstract is poor. For whatever reason you decide to call for an extract, try to select excerpts that indicate the:

- problem
- solution (approach to problem)
- key results
- chief conclusion

If you cannot find all four items, settle for:

- problem
- chief conclusion

The two outlines above work well for research and R&D reports, and we handle very many of that kind. A good system for dealing with such reports is to put the title of the report in the form of a question and then view the conclusions as the answer to the question. These two items are the essence of research. After that, if you can (within the 100-word limit), say something about the approach, and include a key result or two.

IN-REACTOR SODIUM CORROSION OF VANADIUM AND VANADIUM-TITANIUM ALLOYS

TECHNICAL NOTE

KEYWORDS: *sodium corrosion, vanadium, fuel cladding, vanadium-titanium alloys*

② *Vanadium-titanium alloys, exposed to flowing sodium in the EBR-II core suffered small weight losses. In contrast to the behavior of these materials when exposed ex-reactor, no hardened layers were produced.*

① Vanadium-titanium, vanadium-chromium, and vanadium-titanium-chromium alloys have demonstrated sufficient corrosion resistance in low-oxygen sodium at temperatures up to at least 650°C to make them of potential interest as fuel-jacketing materials for sodium-cooled fast reactors.[1] Final judgment as to their adequacy must be based upon performance of fuel elements jacketed with the material of interest. A necessary intermediate step is the in-reactor testing of such materials as materials. Such a program is underway at Argonne and results of the first experiments are now available.

In the first series of experiments, the samples are simple hollow cylinders, 9.5-mm o.d. × 19.2-mm long (5.73 cm^2 exposed surface area) mounted over 4.4-mm-diam stainless-steel rod extensions of fuel-element test capsules located in the core of EBR-II. The samples are on the downstream end of the test assembly and thus are exposed to flowing (3.7 m/sec) sodium at the exit sodium temperature of the given element.

In this experiment, V, V-20 wt% Ti, and V-40 wt% Ti alloys were exposed as part of three different test assemblies with stainless steel and a variety of nickel-base alloys. The compositions of the vanadium alloys are in Table I. All alloys were tested as annealed. Annealing temperatures are in Table II. They were in EBR-II core sodium for approximately seven months. During this period the reactor was at full power for 119 days. Total fluence was 7.2×10^{20} n/cm^2 ($4.7 \times 10^{19} >$ 1.35 MeV). During the test period, oxygen concentration in reactor sodium decreased from ≈ 13 to ≈ 6 ppm, as determined by the mercury amalgamation method[2,3] on samples shipped from Idaho to Illinois.[a] Concentrations of other elements in the sodium, e.g., carbon and nitrogen, were not determined.

The appearance of the samples after removal from the reactor and preliminary cleaning is shown in Fig. 1. Also noted on Fig. 1, the temperature of exposure at full-power operation was either 510 or 530°C. These temperatures were calculated using measured subassembly inlet temperatures and fission rates to an accuracy of ± 10°C.

The unalloyed vanadium was severely pitted with a dimensional change of 2 mm in diameter and ≈ 50% weight loss (620 mg/cm^2). The V-20 wt% Ti and V-40 wt% Ti had small weight losses (4 to 12 mg/cm^2), equivalent to dimensional changes of approximately 0.5 mil. This was too small a change to detect with certainty at this stage of the experimental program. The results are summarized in Table III. Microscopic examination of these two vanadium alloys indicated the absence of a hardened layer on the surface, as shown in Table IV. A hardened layer is normally observed in all ex-reactor experiments, i.e., those in which samples have never been exposed to nuclear radiation (in those cases where weight losses as well as weight gains are encountered), and if this brittle layer reaches appreciable thickness it can degrade stress rupture properties.

TABLE I

Composition of Vanadium Alloys

Material	Ti, wt%	Interstitials, ppm			
		C	N	H	O
V	0	420	250	50	390
V-20 wt% Ti	20.2	480	138	13	358
V-40 wt% Ti	41.0	240	260	99	790

TABLE II

Annealing Temperatures

Material	Annealing Temperature, °C
V	950 - furnace cool
V-20 wt% Ti	900 - furnace cool
V-40 wt% Ti	900 - furnace cool
304 S S	980 - water quench
Hastelloy X[a]	1177 - rapid air cool
Incoloy 800[b]	1066 - rapid air cool
Inconel 600[b]	980 - rapid air cool

[a] Registered trademark of Union Carbide Corporation.
[b] Registered trademark of the International Nickel Co., Inc.

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[a] Shipment of the samples is of significance because of the possibility of oxygen contamination.

Two Useful Checklists

When making entries
in the "Type" Box,
be sure to note the:

- ☑ Type of Document
- ☑ Type(s) of Information in the Document

See pages 23-27 for discussion on type of documents and possible types of information in them.

When Making Entries in the "Category" Box, be sure to note the:

- ☑ Chief Category
- ☑ Other Category or Categories, when necessary

See pages 18-22 for complete information. See also your "Quick-check chart of Categories."

THE ENTRIES YOU MAKE IN THE "TYPE" AND "CATEGORY" BOXES ARE QUITE IMPORTANT

A few reminders about the entries in the "Evaluation" box, and some comments on including evaluation in the abstract:

1. Most reports will call for an X grade (denoting competent work). Y's (denoting fairly ingenious departures from the customary) and Z's (very ingenious work, idea, apparatus, etc.) will be called for less frequently (not many dragon slayers or giant killers). Poor reports (W grade) are rejected, but first see the Assistant Director of NSIC and justify your action.

2. You will notice that the reviewer of the document inserted a "rave notice" in the abstract. Do this when you think you have a standout, but be sure of your ground.

   True, the reviewer is expected to judge the document in terms of technical or scientific worth, but speed reading may not lend itself to sound evaluations. Tread lightly with respect to rave notices or brickbats.

REPORT NUMBER OR OTHER IDENTIFICATION
AECL-2945

NSIC BIBLIOGRAPHIC REPORT

ABSTRACTORS INITIALS: 15 Nov. '67 HW

1–7 ACCESSION NUMBER	8–9 CARD NO.	13–15 TYPE	16 EVALUATION	17–22 CATEGORY	23–26 JOURNAL ABBREVIATION	27–32 SIGNIFICANT DATE MO	DAY	YR.	33 LANGUAGE	34 COUNTRY	35–40 SUBJECT NUMBER
	01	LCB	Z	1805		09		67	E	Q	

41–49 CORPORATE AUTHOR	50 FORMAT	51 BIBLO LIMIT	52 REPORT		54–55 PROPRIETARY

AVAILIBILITY:

TITLE: Principles of Nuclear Safety

ABSTRACT (ABOUT 100 WORDS)

Excellent discussion of factors (e.g., assembly geometry, rod size and numbers, fabrication costs, heat transfer, centerline melting, failure modes) in the design of fuel elements. Includes 29 references.

KEY WORDS

★ Performance limit
★ Centerline melting
★ Fuel element
Reactor, HWR
Canada
Bibliography

Fabrication
Fuel meltdown
Fuel burnup
Fuel integrity
Heat transfer
Heat conductance, fuel to clad

Burnout heat flux
Economics
Cladding

NEW KEY WORD

UCN-6107A (3 10-67) NOTE: NEW KEY WORDS MUST BE DEFINED; ATTACH DEFINITION ON 3 X 5 CARD.

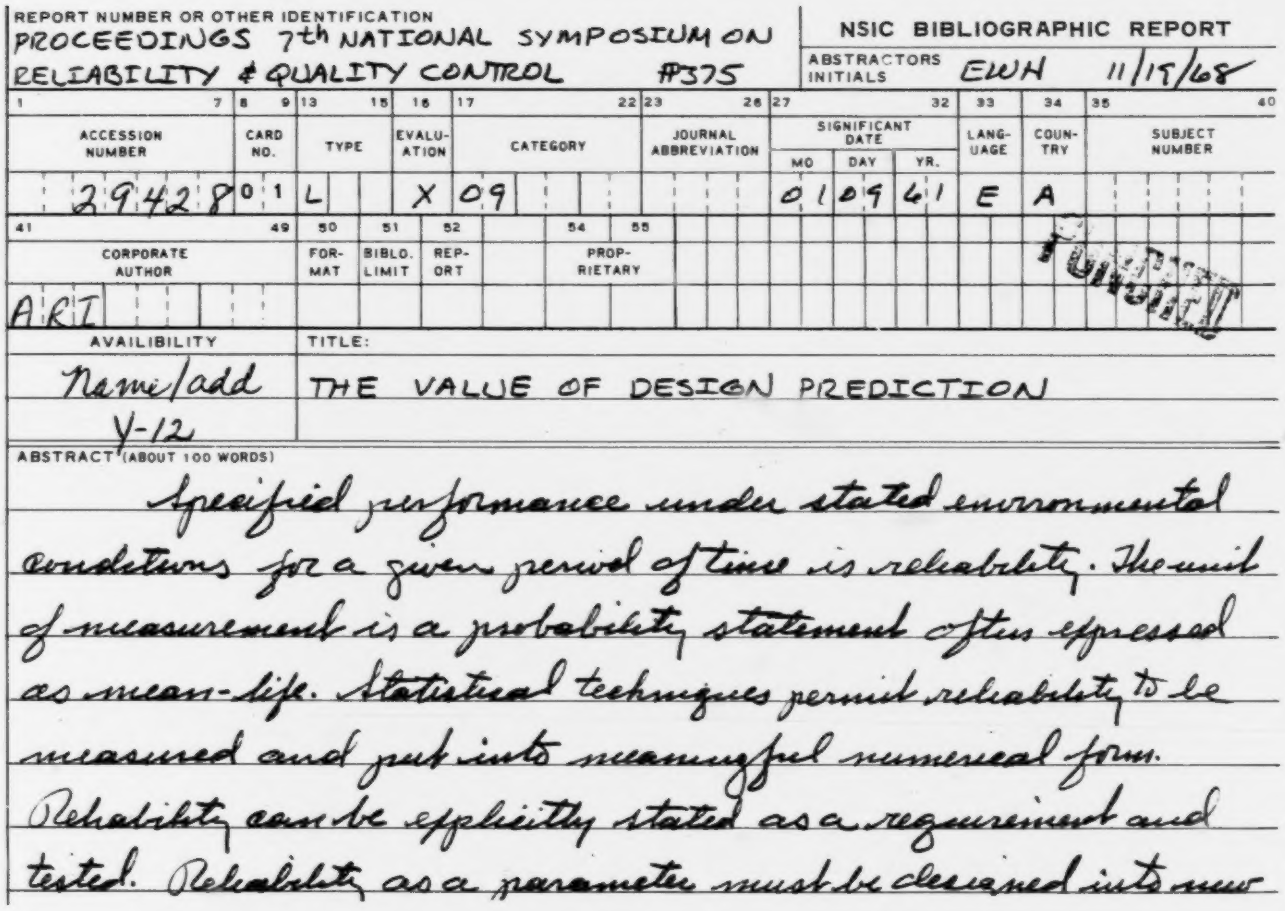
Fate of the Green Sheets

Your green sheets are converted to typescripts, which are stapled to the sheets and then sent to the Computer Technology Center at K-25, where the key punchers transfer the information to data cells (strips of magnetic tape).

Your attention to legibility, organization of thoughts, grammar, punctuation, and diction do much to help office gears mesh smoothly.

The computer print-outs, except for being in all-capital letters, look exactly like the typescript.

As you can see, the space allotted to the bibliographic entries and the keywords is greater than that allotted to the abstracts, hence the desirability of semitelegraphic writing (mixture of complete and incomplete sentences). Hence the need for rhetorically fusing the title and abstract. Although the space limitation works against us, we manage quite well as we shorten the author's abstract or prepare our own concise ones.



REPORT NUMBER OR OTHER IDENTIFICATION
PROCEEDINGS 7th NATIONAL SYMPOSIUM ON RELIABILITY & QUALITY CONTROL #375

NSIC BIBLIOGRAPHIC REPORT

ABSTRACTORS INITIALS EWH 11/15/68

ACCESSION NUMBER (1–7)	CARD NO. (8–9)	TYPE (13–15)	EVALUATION (16)	CATEGORY (17–22)	JOURNAL ABBREVIATION (23–26)	SIGNIFICANT DATE MO (27–32)	DAY	YR.	LANGUAGE (33)	COUNTRY (34)	SUBJECT NUMBER (35–40)
29428	01	L	X	09		01	09	61	E	A	

CORPORATE AUTHOR (41–49)	FORMAT (50)	BIBLO. LIMIT (51)	REPORT (52)	PROPRIETARY (54–55)
ARI				

AVAILABILITY: Name/add Y-12

TITLE: THE VALUE OF DESIGN PREDICTION

ABSTRACT (ABOUT 100 WORDS)

Specified performance under stated environmental conditions for a given period of time is reliability. The unit of measurement is a probability statement often expressed as mean-life. Statistical techniques permit reliability to be measured and put into meaningful numerical form. Reliability can be explicitly stated as a requirement and tested. Reliability as a parameter must be designed into new

L,X 29428 1/1

02 Williams RT
03 THE VALUE OF DESIGN PREDICTION
04 ARINC Research Corporation, Washington, D. C.
05 5pgs. Proceedings 7th National Symposium on Reliability & Quality Control, pg. 375-379, Jan. 9, 1961
...
06 Specified performance under stated environmental conditions for a given period of time is reliability. The unit of measurement is a probability statement often expressed as mean-life. Statistical techniques permit reliability to be measured and put into meaningful numerical form. Reliability can be explicitly stated as a requirement and tested. Reliability as a parameter must be designed into new systems. The purpose of this paper is to discuss ~~the~~ use of predictions as a tool to aid in designing reliability into modern complex systems.

09 Availability - Robert T. Williams — ARINS Research Corporation; Washington, D. C.

07 *reliability analysis + *forecast + design criteria

...
EWH:jc
December 4, 1968
Y-12

Sometimes you can find clues to our keywords by reading the ones found in some of the journals.

Also, many of the documents sent to you for review carry a little card on which you will find clues to keywords.

If you belong to a technical society, why not ask the journal editor to keyword the articles? Even though many of his keywords might not be the same as ours, they can be translated.

HYDROGEN REACTIONS WITH GRAPHITE MATERIALS AT HIGH TEMPERATURES AND PRESSURES

KEYWORDS: *graphite corrosion, chemical kinetics, pyrographite*

Uncl $_{4}$(JAERI–4039) $_{5}$BIBLIOGRAPHY ON IRRADIATED FUEL SHIPPING AND ITS SHIPPING CASKS. $_{6}$Sawai, Sadamu; Shichi, Daisaku $_{7}$(Japan Atomic Energy Research Inst., Tokyo). $_{12}$Oct. 1966. $_{1420}$33p. $_{222324}$Dep.
$_{25}$

$_{26}$bibliographies; engineering; health and safety; reactor fuels $_{27}$ 05B, 13, 06R, 18J

$_{28}$MN-25 $_{29}$NP NSA

15

JUL 11 1967

12. FIVE COMMON FLAWS IN WRITING STYLE

At least five common flaws mar the literary style of technical reports and journal articles, introducing either momentary ambiguity or permanent perplexity. These flaws are especially serious in abstracts. Our chief concern is with the abstracts that we prepare. You are not asked to correct originals, but you are asked to exorcise the following five devils from your own: "stacked modifiers," "smothered" verbs, careless shifts in emphasis, wordiness, and misuse of the present perfect tense. Nothing will be said here about dangerously dangling participles or badly split infinitives. These are fairly well under control, but we want to improve our other linguistic habits so our readers can pick them up. Correct usage can be caught as well as taught; and, through the inevitability of gradualism, the litticher of science can become littature and finally literature. First, we will consider a very annoying flaw, the stacked modifier - the ineptly compounded compound adjective:

1. Stacked Modifiers: Do Not Let Them Reach Critical Mass

Horrible Example:

A digital computer program for reactor site hazards evaluation was prepared. Here, three nouns, used as adjectives, modified a fourth noun: evaluation. Such stacking or pyramiding or modifiers is almost certain to confuse the reader.

Improved Sentence:

A digital computer program was prepared for evaluating hazards at reactor sites. In the above sentence, the modifiers are not stacked, and the verb is nearer the subject, not a grammatical parsec distant, as in the horrible example.

Semitelegraphic Style:

Prepared a digital computer program for evaluating hazards at proposed reactor sites. In your abstracts you may use clipped sentences, letting the reader interpolate the missing words. Otherwise your sentences must be grammatical and meaningful. Our word limit permits such sentences, but do not omit important words.

Horrible Example:

The PWR Core 2 seed 1 fuel plate bonding process was developed at Bettis. The writer could have relieved suspense and prevented confusion if he had not tried to blurt out all his modifiers at once.

Improved Sentence:

The process for bonding fuel plates (PWR core 2, seed 1) was developed at Bettis. Here, the reader can easily determine the subject of the sentence. Science and engineering are concerned very often with things and actions (nouns and verbs), and ordinarily it is useful to keep both in plain view in our sentences. In our abstracts, you can parenthesize to good advantage, packing useful information into a sentence, yet not writing awkward sentences.

Scientific prose is partly characterized by the need for numerous modifiers, by its many abbreviations of units and ratings, etc., and this cannot be avoided easily; but English syntax (word order) must be respected as much as possible. The meaning of an English sentence depends on the position of the word in the sentence. English might be called a positional language, as distinguished from highly inflected languages, where the word endings help bring meaning to the sentence. However, we may stack a few modifiers, provided that they roll off the tongue easily and also penetrate the reader's mind easily. For example: six-foot-long tube. Of course, one must hyphenate correctly if he expects the reader to "hear" the expression correctly. To hyphenate as follows would be incorrect: six-foot long tube. Also, rather than try to pack too many modifiers into a single sentence, write two sentences or parenthesize certain remarks being certain that such a sentence is not confusing.

2. Verb Smothering: Do Not Put Out the Light in Your Sentences

Horrible Example:

The precipitation of iron was carried out by the addition of ammonium hydroxide. Here, verb sense was lost to two noun phrases: precipitation of, addition of. This forced the writer to "carry out" his experiment. Some "execute" them. To judge by its rhetoric, science seems to be a deadly business.

Improved Sentence:

The iron was precipitated by ammonium hydroxide. Good sense of action in this sentence, and it gets to the point quickly.

3. Careless Shifts in Emphasis: Indecision About Which of the Ideas Should be Expressed as Nouns, as Verbs, or as Modifiers

The language is versatile: nouns can become verbs, verbs can be used as nouns or even adjectives; yet, careless shifts, or illogical ones, can deaden the sentence and shift the emphasis. The general notion is illustrated below:

Science appeals to the intellect.

The appeal of science is to the intellect.

Either one is correct, depending on the context; but, if the first construction is called for, use of the second one will put the reader off the pace that had been set for him.

Generally, as the verb goes, so goes the writing. Your job becomes one of preparing lively, crisp sentences, as shown in the examples below, which illustrate tired sentences and vigorous ones. Shown in parentheses are two clipped sentences of the kind that you may use in abstracts.

No attempt was MADE to clean up.

Cleanup was not attempted. (Cleanup not attempted.)

The meter HAS a high sensitivity.

The meter is highly sensitive.

Complementarity EXISTS between the assumptions.

The assumptions are complementary.

The idea HOLDS much promise.

The idea is promising.

A description is GIVEN of the apparatus.

The apparatus is described. (Apparatus described.)

And so on and so on.

4. Wordiness: How to Avoid Grandiloquence and "Longiloquence" in NSIC Abstracts

Technical writing is functional and direct. When one word will do, especially if it is a short, vivid, English word, do not use a phrase or a showy word, as we so often do. This applies especially to abstracts, while a little carefully planned showiness might be advantageous in the body of the document. For most writers of abstracts, this means shucking off bad habits classified as professorial or pedantic writing. English is a vigorous language, developed in a rather hostile and shivery latitude. (Climate seems to influence language, but there is no proof of this.) True, we Anglicize and use many long foreign words for convenience and nuance. Basically, English is vigorous, with many short words: "Alas, poor Yorick, I knew him well;" not, "Alas, unfortunate Yorick, I was contemporaneously familiar with him." Plain English is a beautiful expository language; so, when possible, shun "polysyllabic Latinisms" (also called "professorial polysyllables"), and do not mimic the pompous, windy stuff found in some abstracts. The two lists below give an idea of what is roundabout and what is not.

The Long Way (Verbal Overkill)	The Short Way (Usually Preferable)
at the present time	at present, now
are dependent on	depend on
of the order of	about
approximately	about, nearly
in close proximity	close to
prior to	before
following	after (it is strange that "before" and "after" have almost disappeared from technical writing; this is not to say that "prior to" and "following" do not have legitimate uses)
of such a fundamental character	so basic
initiated	started, begun
owing (or due) to the fact	because ("since") is often all right but remember that it also connotes time)
as a result of	because of, because

of an indefinite nature	indefinite
parameter	factor, condition (often the best choices; "parameter" is mostly a mathematician's word)
utilize	use (the two words are often misused; we use a key to unlock a door but utilize a piece of wire when we lose our key)
despite the fact that	although
commercially available equipment	commercial equipment
fabricate	make
in length	long
physical plant ("physical" is often used as a modifier of "plant", but needlessly because we do not build metaphysical plants or whatevers)	plant
high rate of speed (which really means, "high rate of rate of motion")	fast
long (short) period of time	long time, short time
in order to	to
at that time	then
in the event that	if
as a result	therefore, thus
order of magnitude larger than	ten times as large as
employed	used
magnitude	size
an alternative method	another method
virtually all	nearly all ("virtually" means "in effect but not in fact")

The list could go on and on and on. No doubt you can think of other examples. It is interesting that our preference for showy words can sometimes make genuine trouble for us. For example, some writers think that "inadvertently" is a fancy synonym for "accidentally;" but, "inadvertently" means "carelessly," "negligently," not only by ordinary definition but by legal definition. It sometimes pays handsomely to break with faulty tradition - with the tendency to give our writing a high hat and a cane. With regard to abstracts, it always pays off in reader satisfaction.

5. Misuse of the Present Perfect Tense

If we remember that the present perfect is a progressive tense and that the simple past tense is a point (in time) tense, we can shorten our sentences, avoid illogicalities, and help the reader keep track of time.

Example: The flux has been measured by . . .

Better : The flux was measured by . . .

Comment: In the first example, the writer was telling about a completed act, but he used the wrong tense (the present perfect). The second example clearly indicates a completed act, putting the reader at ease with respect to the time of the event.

Example: Flux has been measured in several ways, but now we know that the most reliable way is to . . .

Example: It has already been shown that the most reliable way to measure flux is . . .

Comment: In the two examples immediately above, the progression of events is clearly indicated by the progressive tense.

Probably 98% of the "has been" and "have been" constructions in abstracts and in reports represent misuse of the present perfect tense. How did this misuse get such a hold? Maybe because it represents what we believe to be the genteelism of science. Certainly it represents one of the bad linguistic habits that we pick up by reading newspapers and listening to subliterate news broadcasters.

To summarize, abstracts must be simple, direct, and grammatical. Try not to construct hazardous grammatical chasms for your reader to cross; do not stack modifiers too high; do not smother verbs; decide carefully which of your ideas should be expressed as nouns, verbs, or modifiers; shum pretentious writing; use the point and progressive tenses skillfully.

13. READABLE HANDWRITING OR PRINTING: A FAVOR TO SECRETARIES

It is imperative that all your entries on the green sheets be legibly written or clearly printed so the secretaries who prepare the typescripts from them can proceed without interruption. They can stop and decipher some of the bobbles even if the words are unusual,but they depend on the reviewer to write or print plainly to prevent unnecessary delays in transcription. Also, use a sharp pencil; preferably one with soft lead, for blackness. "Cursive" may be an apt adjective for writing that is hard to decipher, where i's look like e's, o's like a's, etc.

A misspelled word that enters a typed abstract and then appears in the computer output is merely disconcerting to NSIC, nothing more. On the other hand, a misspelled keyword (which includes a mispunctuated one) causes several days of delay if not caught before the typescript goes to the computer center. The secretaries and the editor try to correct misspelled words, but both depend very much on the reviewer, who must write or print plainly.

14. BRIEF LOOK AT HOW INFORMATION IS RETRIEVED FROM THE COMPUTER

This section is chiefly intended to give you an idea of how keyword indexing leads to information retrieval. It is also intended to indicate why you should establish rapport with our literature retrievers, with whom you will have to confer frequently because you both work from the same thesaurus (you to "inform" the computer, and they to "query" it). Good keywording does more than anything else to prevent an overproduction of "false drops" (irrelevant or obliquely relevant abstracts) from the computer. It also ensures that the pertinent references stored there will drop.

As an example of information retrieval, a book-store analogy might be useful, considering that our computer files can be regarded as a book store. Suppose that you were asked to buy a murder mystery, one in which the victim was done in by radiation. And suppose that you went to a bookstore in which you had to formulate your request by consulting a keyword list - the same list that was used to file the books.

You would first push the "fiction" button to eliminate history, mathematics, biography, etc. Then you would push a button labeled "murder mystery," to eliminate everything else in the fiction field. Finally, you would push the "death by radiation" button to eliminate death by guns, poison, etc. After a one-minute wait, as many as six books might come along on a moving belt for your inspection. Hopefully, one of them might suit you. The bookstore analogy breaks down in only one important sense: NSIC delivers abstracts - condensed information.

However, if you had been asked to buy a murder mystery, method of murder unspecified, you would have got many more books from which to choose. In the first instance, by pushing the third button, you did a rather good job of hair splitting, which is what we must do for many of our customers.

The reviewer at the bookstore had to speed read each book and had to describe it in terms of keywords that would permit either a general search or a hair-splitter, just as the reviewer at NSIC must do for the documents that we deal with. Thus, when keywording, keep our declensional nomenclature in mind (main-thrust words, modifiers, and generic words). Also, do not overlook keywords that denote site or location and aspect of the analysis or treatment. See Chapter 7 and pages 68 and 69 for a discussion of such words. Carefully selected keywords, along with the other indexing entries on the green sheet, will help us go far toward ensuring meaningful storage and retrieval of information.

PART II. GUIDELINES FOR THE EDITOR

15. STRUCTURE OF THE JOB; DESCRIPTION OF THE "RAW" COPY AND THE FINISHED PRODUCT

Back when communicators carved their messages in rock, they also produced a lot of chips and splinters. If we regard chips and splinters as misleading punctuation, unsyntactical sentences, misused words, poorly organized thoughts, etc., splinters are still being produced, hence the need for editors. One of your chief duties as editor is to stop the chips before they hit someone in the eye, and to stop misspelled keywords before they hit the computer. These responsibilities will consume most of your time. But there are two other duties: maintaining the thesauruses and the dictionary and consulting with the reviewers about improvements in the output of the information center.

The purpose of this part of the booklet is to look at the three-part structure of your job; look at the raw copy sent to you, and the finished product; and stress the criteria for each of your three main duties so you can help our reviewers to speed literature searchers on their way.

Basically, the structure of your job can be seen in terms of three functions, all, in the last analysis, adding up to the transfer of meaningful abstracts from the computer to the scientists and engineers who subscribe to our nuclear-safety information service. Ultimately, everything that the reviewer does (see Chapters 1-14) is also aimed at these condensations of information, which help our subscribers decide for or against reading the original document. The editor's duties are:

1. EDITORIAL, where you will help reviewers ensure that their abstracts are grammatical, correctly punctuated, and concise (we like 100 words or less; occasionally 125 may be used). Our reviewers work fast, and that naturally leads to bobbles. You will pay less attention to author-prepared abstracts, limiting attention to misspelled words or misleading punctuation. Be sure that keywords are spelled and/or punctuated correctly.

   Edit twice - first,the green sheet, finally the typescript of the green sheet.

2. LEXICAL, where you will be responsible for maintaining the keyword thesauruses (we have two, one in book form, one in chart form) and the dictionary.

3. CRITICAL, which applies to the two items above but where you will also help the reviewers prepare abstracts that help improve intra- and interdisciplinary communication.

Your raw copy consists of "green sheets", our name for the office forms used by the reviewers. See pages 56 through 77 for examples and comments about the reviewer's entries on the green sheets. Many green sheets will contain *reviewer-prepared abstracts*. Others will indicate that the *author's* abstract be used, and some will indicate that an "extract" be used. You will be concerned with six entries on the green sheets: Type, Evaluation, Category, Abstract, Keywords, New Keyword(s). As to Type and Category, you should look at the entries on every tenth green sheet, just to see how well the reviewers are handling them, and then you should consult with the reviewers who are slipping. Edit *every* reviewer-prepared abstract closely, every list of keywords, and every new keyword, plus the reviewer's definition. Edit extracts and original abstracts lightly. The green sheets are then used in the preparation of typescripts which are to be edited (mostly for typographical errors) and sent on to the computer center. At the center the information is put in the data cells until published in final form.

The published material (computer print-outs) looks like this:

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15-18972        ALSO IN CATEGORY 14
POSSIBLE EFFECTS OF THE DISPOSAL OF RADIOACTIVE WASTES ON THE RESOURCES OF THE SEAS, OCEANS, AND SURFACE
 WATERS
INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, AUSTRIA
STI-PUB-126 + CONF-660507 +.  85 PAGES, 22 FIGURES, 22 TABLES, 93 REFERENCES, SEPTEMBER 1966, DISPOSAL OF
 RADIOACTIVE WASTES INTO SEAS, OCEANS AND SURFACE WATERS.  PROCEEDINGS SERIES.  PROCEEDINGS OF THE
 SYMPOSIUM HELD IN VIENNA, AUSTRIA, MAY 16-20, 1966

      THE PRESENTATIONS AND DISCUSSIONS OF THE 56 PAPERS AT THE SYMPOSIUM COVERED A WIDE VARIETY OF
       SUBJECTS WITHIN THE SCOPE OF EFFECTS OF RADIATION ON THE ENVIRONS OF THE SEAS, OCEANS, AND
       SURFACE WATERS.  RESEARCH WAS DIRECTED TOWARD MORTALITY RATES, MUTATIONS, ADSORPTIONS,
       UPTAKE, RELEASE, BREEDING, INCUBATION AND HATCHING, AND ALL THESE WITH RESPECT TO A WIDE
       VARIETY OF CIRCUMSTANCES, REGIONS, AND AQUATIC CONDITIONS.  CONCLUSION - THERE ARE
       DETRIMENTAL EFFECTS OF DISPOSAL AS TREATED HEREIN, BUT OF A RELATIVELY SMALL AMOUNT, YET
       SUFFICIENT TO JUSTIFY CONTINUED RESEARCH.

AVAILABILITY - INTERNATIONAL ATOMIC ENERGY AGENCY (NEW YORK OR GENEVA), $16.50 COPY

BIOLOGICAL CONCENTRATION, ALGAE + BIOLOGICAL CONCENTRATION, AQUATIC ORGANISMS + BIOTA + COBALT +
 CONTAMINATION + DOSE MEASUREMENT, EXTERNAL + DOSE MEASUREMENT, INTERNAL + FALLOUT +
 IAEA (INTERNATIONAL ATOMIC ENERGY AGENCY) + IODINE + RADIATION EFFECT + SEDIMENT + STRONTIUM + X-RAY +
 ZINC
```

These print-outs appear in two publications: Indexed Bibliography of Current Nuclear Safety Literature (usually about 500 pages) and SDI (Selected Dissemination of Information) cards, which represent specialized literature searches for our subscribers.

From the editor's viewpoint, he does just what he would do in any publishing house; and if he is able to detect technical errors in the abstract, so much the better. Occasionally, you will be asked to edit or help edit other material, but about 99% of your work will be with the raw copy for the computer print-outs.

Next, we will go into the criteria for editing the abstracts so you can get an idea of the standards against which your chip-catching or editing must be measured.

16. GENERAL CRITERIA FOR EDITING ABSTRACTS

Since the editor is first of all a critic, this chapter is intended to collect the criteria to help you make reasoned judgments about the grammar, diction, etc., in abstracts prepared by our reviewers. You will also want to know how to get around the deficiencies of the print-out machine, which among other things, limits punctuation to periods, commas, and hyphens. Actually, the criteria represent nothing more than standards for pleasing those who use our output as they search the literature for answer to their questions.

Why be critical of sentence structure, for example? Does an awkward sentence really matter since the reader can probably figure it out anyway? John Maddox, editor of Nature, recently answered the question. He said that editing is a means to a very important end, and he made it clear that incorrect sentence structure often makes scientific articles unintelligible, hastening their obsolescence. This statement referred to the average half-life of the value of a good technical article, which is said to be about two years. He said that it is unfortunate that this average half-life can be made much shorter if the statements and conclusions in the articles are ungrammatical and therefore confusing. Constructive criticism, the basis of editing, clearly has its uses.

16.1 Standards for Grammer, Diction, etc.

Rather than try to establish a method for editing abstracts (every editor has his own way of organizing and doing his work), it may be more useful to point out the criteria on which judgments may be made with respect to diction, forms of expression, grammar, spelling, etc. In essence, we try to follow the practices of educated people.

Before discussing the criteria, it may be well to outline some of the most common errors to look for in abstracts prepared or shortened by the reviewers. (Pay less attention to original abstracts because they have already been edited.) Our reviewers have to work fast, and this leads to errors in grammar, diction, and punctuation, as might be expected. Mostly, you will have to:

1. Correct misleading punctuation
2. Correct misused words
3. Eliminate superfluous words
4. Recast awkward sentences
5. Be sure that the sentences in a shortened abstract track well
6. Look for word ellipsis (often, the word "that" is missing from sentences)
7. Edit for style points. See Section 16.2

Back to the criteria. This report does not provide comprehensive rules on grammar because many good books are available, one of which is:

J. C. Hodges, Harbrace College Handbook, Harcourt, Brace and Company, New York, 1962

However, a few important rules of writing style are presented in Chapter 13 of this report, where five prominent flaws in writing style are covered: "stacked" modifiers, "smothered" verbs, careless shifts in emphasis, misuse of the present perfect tense, and just plain verbosity. Our own abstracts get the full treatment; pay less attention to original abstracts. Our reviewers are usually careful, but since they work fast, they occasionally write an awkward sentence or use one of the narcotic circumlocutions common to many abstracts. If interested in more criteria and criticisms, read:

P. G. Perrin, Writer's Guide and Index to English, Scott, Foresman and Company, New York, 1959

Bergen Evans and Cornelia Evans, A Dictionary of Contemporary American Usage, Random House, New York, 1957.

Because of the upper limit on the number of words, we lean toward a clipped, semitelegraphic delivery, something like that in "Newsgrams" in U.S. News and World Report. See pages 52 and 53 of this report for more on semitelegraphic writing and why we think that the style is stimulating, not soporific. We assume, possibly correctly, that literature searchers do not like to read but that they may not object to reading rather breezy abstracts. With experience, the reviewers learn to distinguish between a pleasing staccato delivery and a machine-gun barrage, although they occasionally need help.

As to doing something about misused words in our own abstracts, adopt this viewpoint: do not hesitate to make what the descriptive linguists scornfully qualify as "value judgments." Descriptive linguists seem to think that one word is as good as another, which may explain why they do not object to "sophisticated" machines, for example. We like to think that machines are not adulterated or worldly wise but that they can be intricate, complicated, complex, etc. Our doctrine of usage is not a neutral one characterized by no viewpoint at all. Instead, our viewpoint is intended to prevent the further fragmentation of the English lanauage into one or more sublanguages - e.g., Engineering Choctaw. Already we have"Federal-ese," "Madison Avenue-ese," etc. Much of man's inhumanity to man begins with his inhumanity to language, which may stem from a dangerous lack of concern for clear communication.

Next, a few words about the local ground rules that we had to adopt concerning certain limitations imposed by the computer print-out machine.

16.2 Local Standards for Punctuation; Other Limitations Imposed by the Print-Out Machine

The editor at every publications office is limited by the shortcomings of the printing machines and the number of type fonts on hand. To skirt the consequent problems, local ground rules or style points must be established. Here, the problem is quite out of the ordinary because our "printing press" is a print-out typewriter, which can be compared with a typewriter that can handle only "on-the-line copy." No sub- or superscripts can be printed, for example, thus they must be indicated in another way. Moreover, quotation marks, apostrophes, and ampersands may not be used. Greek letters must be spelled out. Question marks cannot be used; we use periods and hope for the best. Paragraphs are indicated by three asterisks - no indention.

We have found ways around most of the restrictions in terms of punctuation marks, which limit us to the use of periods, commas, hyphens and parenthesis marks). To indicate colons, we use the "light colon" (space-hyphen-space). We do not use apostrophes and have found no substitute. This turns possessives into plurals, seeming to indicate that we are for togetherness and against possessiveness (not a bad idea). However, we defensively assume that most of our readers probably know that print-out machines are not very versatile. We can not use exclamation points either, but this does no harm because scientists and engineers are not easily surprised. Turn to Appendix B for our style points to see how we indicate paragraphs on the green sheets, how we handle exponents, etc. To save yourself trouble, notify all new reviewers and secretaries of our local ground rules so the reviewers and secretaries will learn to use the style automatically.

16.3 Criteria for Entries in the "Category" Box on the Green Sheets

The reviewer is responsible for entering the alphabetical designations that denote the category or categories of information represented by the document under review (see the "Category" box on the green sheet, page 73; read Chapter 4 to get an idea of how the reviewers decide categories of nuclear safety information). Look at every tenth green sheet to see how well the reviewers are categorizing the information. Miscategorization helps "bury" abstracts in the data cells. If you detect slippage, notify the reviewer.

In your infrequent discussions with reviewers about their possible miscategorizations, you will be dealing with the principle of proportionate difference, which pervades many decisions made at information centers (and in fact nearly all the decisions made in life). In essence, the principle says that sometimes it can be difficult to tell the difference between a 1-pound weight and a 1.1-pound weight by hefting them. In a sense, the reviewers sometimes have a similar problem trying to decide whether the information in a document represents only a single category of nuclear-safety information or whether some of the information impinges sharply (not obliquely) on a second or third category.

As to assigning a second or third category number in the Category box on the green sheet, we say that if a section or subsection of the document has been devoted to information that belongs in a second or third category, the fact must be indicated in the Category box. This is usually called "judgment by rhetorical proportion," clearly a part of the general principle of proportionate difference. Many times, however, the writers of the documents do not provide such good handholds for the reviewers.

Then the reviewers have to rely on their sense of proportion to tell whether the report also contains information that impinges sharply on other categories. Even experienced reviewers can be of two minds in such a case.

In dealing with what may be incorrect categorization, you may have to call in a third party, the Assistant Director of the Information Center, especially if it seems that a number of similar documents are in question.

16.4 Criteria for Entries in the "Type" Box on the Green Sheets

In the "Type" box on the green sheet, the reviewer enters alphabetical designations that denote the type of document and type of information in it. Incorrect indexing of this kind also helps lose abstracts in the data cells. See Chapter 5 for a discussion of the types of documents that we handle, and the types of information that may be in them. While "typecasting" is the reviewer's responsibility, it is yours to look at every tenth green sheet to see how well the reviewer is doing. If you see any slippage, notify him. If neither you nor the reviewer can settle the matter, call on the Assistant Director to help decide.

Next: standards for maintaining the thesaurus and the dictionary.

17. THE THESAURUS AND THE DICTIONARY: LEXICAL STANDARDS AND GENERAL DISCUSSION OF KEYWORDS

One purpose of this chapter is to establish criteria against which keywords and their definitions may be judged. Keywords point most accurately to pertinent abstracts during a search of the data cells. Here, we will not go into the details of the thesaurus or the dictionary (format, rationale for the two forms of the thesaurus - book type and chart type - etc.). Such information is in Appendix C. The chapter has two other aims: to give you an idea of the denotations and connotations of keywords and to look into the sources of keywords. Hopefully, the following three sections will help you make reasonable judgments as you add to the thesaurus and the dictionary.

First, it should be said that decisions about our keywords and definitions are fairly easy to reach because we deal mostly with only one part of speech - the noun. Compilers of general dictionaries, on the other hand, not only need a good understanding of all the parts of speech but a sound appreciation of the whole spectrum of communication issues that characterize the thousands of emotionally charged words of the common language. They also need a good idea of the psychological and metaphorical extensions of many words. Here, we are concerned with only the intellectual component of words and meanings. Also, we do not define the self-explanatory words that comprise a good fraction of the thesaurus - chemical elements, alloys, nuclear constituents, geographical locations, and rivers.

17.1 Criteria for Keywords and Definitions

Which is the most important index or guide for facilitating a search of the data cells so that pertinent abstracts are found? The keyword. The reviewer enters other indexing entries on the green sheets, but they are not as important to a literature search as the keywords are. The criteria for keywords and their definitions reduce to three:

1. The keyword should express the intended idea or image as definitely as possible.

2. When necessary, the definition should distinguish the intended image or idea (denotation) from the image(s) or idea(s) that might be suggested by the word (connotation).
3. When necessary, the definition should indicate related keywords and keywords for which the one being defined might be mistaken.

See page 43 for an example of a keyword and its definition, plus a few hints on how to define words unambiguously. You may be able to think of better ways to lessen or eliminate ambiguity. See also Appendix C for more on the thesaurus (book type and chart form) and the dictionary, plus instructions on how to keep the thesaurus at the computer center up to date. The Appendix deals mostly with format and the "mechanics" of maintaining the thesaurus and the dictionary.

To acquire a useful background about keywords - how reviewers use them, select them from the thesaurus, submit new ones, etc., read the following chapters in Part 1:

Chapter 7, which establishes guidelines to help reviewers select keywords as they keyword the documents.

Chapter 9, which tells the reviewer how to submit a new keyword and its definition.

Chapter 10, which tells the reviewer how to request that a keyword be altered.

Chapter 14, which indicates how keywords are used to store and retrieve information.

Generally, keywords and definitions are not very troublesome. Most come from the standard language of science and engineering; others, along with their definitions, must be critically examined according to the three standards noted above.

17.2 Denotations and Connotations of Keywords

The purpose of this section is to provide a little insight into the denotations and connotations of our keywords. This may help you when you attempt to define a proposed keyword that does not already have a well-accepted definition or for which you cannot find a definition. Ordinarily, new keywords will come equipped with definitions in the sense that the reviewer can usually provide a useful one that may require only a little editing or questioning on your part so you can be sure of denotations and connotations. Your aim will be to help prepare a definition that emphasizes the use of the word in a nuclear-safety information center.

We have two broad classes of keywords: "thing" words (RIVER, COLUMBIA; URANIUM; FUEL ELEMENT; etc.) and "think" words (ACCIDENT ANALYSIS; ACTIVATION ENERGY; MAXIMUM PERMISSIBLE BODY BURDEN; etc.). Many of the thing words are not defined because they express the intended image or idea very definitely (chemical elements, rivers, geographical locations, etc.). This helps keep the dictionary from getting unwieldy. All think words (concept words) are defined because they represent concepts - something conceived in the mind - and thus may have denotations and connotations.

Some of our thing words refer to particular reactors - GETR (TR). Others refer to the class of reactor: REACTOR, TEST, of which the particular reactor just mentioned is a member, as indicated by the letters in parentheses.

A keyword for a concept may signify, for example, a single branch of some subject or suggest more of the organized knowledge of the subject: WIND PROFILE and METEOROLOGY.

Some of the keywords about concepts conjure up images of actions - FAILURE, OPERATOR ERROR, for example. Others symbolize actions of a different kind: CONVECTIVE BOILING, for instance.

Usually, the thing words are easy to define, and some we do not define at all (chemical elements, for example). Occasionally, words that represent something conceived in the mind can give trouble, but one has recourse to the ordinary and the specialized dictionaries. If the word is not defined elsewhere, or if a definition has to be altered a little to suit the need, you and the reviewers, and sometimes the Assistant Director, will have to arrive at a suitable definition. Actually, our dictionary is a dictionary/glossary on that account, but we try to adhere to the three criteria noted in the immediately preceding section.

Where do we get our keywords? Why are some keywords, along with their definitions,debatable? Should you accept every new keyword? These questions are answered in the next section.

17.3 Sources of Keywords: Grounds for Accepting or Rejecting New Ones

Our reviewers are the immediate source of keywords, which they take from the indexes of widely used textbooks, from the standard language of science and engineering, from scientific dictionaries, and from the reviewer's own knowledge of newer terminology in his field. We accept without question the widely taught and used words and definitions submitted by the reviewers. However, some of the narrowly used words and the definitions may be challenged, sometimes successfully. Such words do not come along often.

When a proposed keyword and its definition are debatable, the editor or other reviewers may be called on for arbitration to try to achieve group solidarity in sentiment and belief. Such consensual validation can be risky; but, so far, nothing more than a bowing acquaintance with etymology and semantics has been needed to trace the ancestry of proposed keywords, settle on their pedigrees, and sort out their possible irrelevant connotations.

Most of the discussions center on the selection of a new word whose meaning the reviewer himself does not trust, maybe because he senses that the word is not used widely enough, because it might easily connote something irrelevant, or because it may be synonymous with a word already in the thesaurus.

A proposed keyword is rejected if a combination of two other words in the thesaurus may be used instead. We try to keep the thesaurus from getting too long. The unabridged dictionary, for example, boasts 450,000 words, when 449,998 would do as well. For instance, it defines "stump", "puller", and "stump puller". It also defines "tooth", "brush", and "tooth brush". Our aim, however, is not to go for distance, which is why we, for example, have the words STEAM and EXPLOSION but not STEAM EXPLOSION. When we want to keyword a document about a steam-engendered explosion, we use STEAM and EXPLOSION.

A proposed keyword is rejected if it is synonymous with one we already have, although you should consider entering the proposed word in the master thesaurus as a synonym (lower-case letters), cross-referencing the already-established keyword (upper-case letters). See Appendix C for the format.

What follows may or may not impinge sharply on your duties as lexicographer, but it may help you keep your guard up. It is intended to point out that the scientist's much-vaunted objectivity sometimes does not extend to his choice of words. His customary detached interest sometimes lapses into a highly personalized approach, a subjectivism that says in essence that his individual feeling or apprehension is the ultimate criterion for choosing the right word. Thomas Huxley put it well: "Do not trust the words of the scientists." He knew better than most that if science (and technology) is to advance, it should not set verbal traps for itself.

The language of science has more than its share of misnomers and dead metaphors; and new misnomers and live metaphors keep coming on, either because the originator has poor word sense, because he likes the word, or because he is in a branch of science in which cause-effect relations are still vaguely understood. These conditions breed vague language. Some of the dead metaphors are still with us: "force" and "energy", for instance. Such words, deeply entrenched, may never be dislodged from the language of science, even though their irrelevant connotations create confusion. Surely, many beginners in physics have had difficulty with the concepts denoted by "force" and "energy", and more recently, "quarks". In molecular biology, we have "messengers," a term that reveals some anthropocentric groping for cause-effect relations.

Then one must deal with shoptalk and the jargon of the schools (where "school" represents a school of thought and the language used to express it at a university, a company, or a National Laboratory). For example, the term "ice-condenser containment" got its start where this containment vessel concept was developed. Such a containment vessel is one in which ice is used to quickly condense the steam (lower the pressure) resulting from a ruptured primary-coolant pipe. Our keyword is: CONTAINMENT, ICE CONDENSER, which clearly indicates that the containment vessel condenses ice. Neat trick.

Although none of our keywords represents units or ratings, it may be useful to say something about them. Science has more than its share of personalized ones - Gauss, Oersted, etc. - in which length, mass, or time are hidden from view, while a rating such as "meters per second" gives the user a sharp sense of length and time. Personalized units and ratings can be objected to because they conceal mass, space, and time while conjuring up images of men. Huxley's admonition is not as belligerent or contentious as it seems, and lexicographers at information centers might do well to adopt it as their motto.

18. CRITERIA FOR JUDGING THE INTELLECTUAL CONTENT OF REVIEWER-PREPARED ABSTRACTS

Your duty as judge of the intellectual content of abstracts prepared by our reviewers is to help determine whether these miniaturized reports establish rapport with literature searchers. To put it another way, your aim is to help reviewers answer the practical questions that a literature searcher would ask. Some of these practical questions are listed below, and while these same items are discussed in Part 1 of this report, you may still have to help new reviewers with their early abstracts. And you will want to seek other practical questions through discussions with all reviewers, covering all categories. Because of the work load we do very little with the intellectual content of original abstracts, although we try to see that our deletions have not removed any key facts or ideas. However,we edit all style points (see Section 16.2).

We believe that a reviewer-prepared abstract about research or research-and-development work meets useful standards when it answers these four key questions - not in detail, of course, but adequately:

1. What was the problem?
2. How was it solved or approached?
3. Does the abstract present a few key results?
4. What are the conclusions? (Was the problem solved, and to what degree of satisfaction? . . . or was it not solved?)

We also say that items 2 and 3 may be omitted and sometimes must be, especially if their inclusion would make us overrun our limit on the number of words that we may use. Readers are essentially interested in success stories (what was the problem? did you solve it?). At least that's what we assume. We also know that some of the items may have been omitted from the document in the first place, and our reviewers are not asked to "crystal-ball" it. In any case, the four questions should be answered in that order when it is possible to answer them. The numbered sequence simplifies the reviewer's work because it presents him with a ready-made and logical outline for his abstract.

As to question-and-answer reports, the reader's questions are obvious:

1. What was the question?
2. What was the answer?
3. If the answer is too long, where can it be found in the original document?

Some of our abstracts - summaries of accident reports, for example - lend themselves to the customary reportorial questions, not all of which can be answered by our reviewers unless answered in the original document:

1. Who?
2. What?
3. Where?
4. When?
5. How?
6. Why?
7. What about preventive measures? (Important question for reports about accidents.)

For data collections, the following kinds of questions should be answered (most of our data collections refer to data-gathering expeditions to survey fallout from nuclear detonations, determine radiation in the vicinity of reactors, decide how much iodine is entering the food chain, etc.):

1. Where was data obtained? (Often answered in the title of the document.)
2. Why was the data collected? (Often clearly implied in the title.)
3. When? (Often answered in the title, especially for "series" reports.)
4. How is the data presented - in graphs or tables?
5. Significance of the data? (Conclusions - what does the data mean? Often not answered by author.)

Other kinds of data reports will come along, such as data collected to aid some engineering project or to confirm or refute a hypothesis, etc. The five points listed above will suit most occasions, and, as noted, some of the answers will be in the title of the document, eliminating the need to say anything in the abstract. If one were to choose the most meaningful items, it appears that items 1, 2, and 5 would be the most significant. Unfortunately, the significance of the data is often omitted by the author of the document, presenting the reader with a lot of facts . . . but facts without real significance to anyone except the person who wrote the report, or maybe to the person or small group for whom it was intended. Thus, interdisciplinary curiosity is frustrated.

To trace the ancestry of a reviewer-prepared abstract and thus become a fairly knowledgeable judge of abstracts, read the following:

> Chapter 3, which attempts to explain how documents are reviewed according to our method of speed reading.
>
> Chapter 11, which offers hints on how to prepare abstracts, how to shorten originals, and how to prepare extracts.
>
> Appendix A, which gives an idea of how abstracts of question-and-answer documents are handled.

Of course, the intellectual content can be diminished if the information is not conveyed grammatically, if the punctuation is misleading, etc. Editorial criteria are presented in Chapter 16. The idea behind this emphasis on criteria is that it seemed simpler to tell an editor what to think about rather than to tell him how to think. If you can improve the standards, please do so.

19. CONCLUSIONS AND RECOMMENDATIONS

It is difficult to draw conclusions about a guide such as this. Presumably, it will be useful to new reviewers or to a new editor. It spans the spectrum of both jobs and should help accelerate apprenticeship. Key points were made - and made repeatedly. Here, repetition was handled in terms of re-petitioning the reader. While the approach to reviewing and editing represents the conventional wisdom at the Nuclear Safety Information Center, some of it may be applicable at other information centers. As to recommendations, they are the customary ones: if a procedure can be simplified, simplify it; if a procedure can be eliminated without jeopardizing the efficient storage and retrieval of information, eliminate it.

[1] J. R. Buchanan and Wm. B. Cottrell, A Summary of NSIC Activities, 1963-1967, USAEC Report ORNL-NSIC-46, Oak Ridge National Laboratory 1968.

[2] Directory of USAEC Specialized Information and Data Centers, October 1968, USAEC Division of Technical Information, Oak Ridge, Tennessee.

[3] Directory of Federally Supported Information Analysis Centers, April 1968, Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Springfield, Virginia.

[4] Proceedings of the Forum of Federally Supported Information Analysis Centers, November 7-8, 1967, Clearinghouse for Federal Scientific and Technical Information, U. S. Department of Commerce, Springfield, Virginia.

APPENDICES

APPENDIX A
HOW TO HANDLE ABSTRACTS FOR DOCUMENTS IN CATEGORIES 17 AND 18

It should be mentioned at the outset that the handling of abstracts for documents in Categories 17 and 18 consists mostly in preparing them. Not many of the documents come equipped with abstracts. On the other hand, some of the documents are standard R&D reports, with the usual organization - title, abstract, introduction, body of report, and conclusions. These of course can be handled as described in Chapter 11, which is to say that you will have an abstract to start with and that you may use it as is, shorten it, or indicate that an extract be used. Also, since most of the documents in these two categories lack an abstract, they cannot be skimmed but must be scanned (see Chapter 3 for skimming and scanning).

However, your work has been simplified with respect to preparing uniformly high-quality abstracts. Nine models are presented here to help you handle each kind of summary. The models were derived from what was said in Chapter 11, and they will give you a good idea of the kinds of questions we think our subscribers would want answered - the kinds of key facts and ideas they would expect us to summarize for them.

Before presenting the samples of the abstracts that dominate the field in these two categories, it may be useful to outline the remainder of this Appendix:

1. Distinguishing features of the bulk of the documents.
2. Lists of keywords to indicate (a) specific kinds of documents and (b) specific aspects of the analysis or treatment presented; these two lists will help you decide some very important keywords.
3. Nine kinds of abstracts, presented as computer print-outs, along with comments.
4. Suggested literary style for your abstracts.

Chief Characteristics of the Documents

The following main features mark many of the documents in these two categories - features that affect the preparation of abstracts:

1. The information in the documents represents nuclear safety by definition, even though there may be some question as to the immediate application (e.g., a generalized description of a customary type of heat-transfer calculation). All safety-analysis and design reports are in Category 18. All reports about operating reactors, and all license changes are in Category 17. The significance of the information governs its treatment when abstracting, but not its acceptance or rejection. The next three items in this list indicate basically how and why we handle the abstracts the way we do.
2. Many of the documents are issued serially (monthly operating reports, technical-specification changes, responses to AEC questions), and they cover extremely broad ranges. The broad coverage calls for a necessarily shallow treatment in the abstracts, and fixed formats are required to place this serially issued information in context.
3. Frequently, the fine subdivisions of information and the serial-story nature of some of the documents call for high precision in choosing keywords that represent (a) the kind of report, (b) the aspect of the analysis or other treatment in the report, and (c) the hardware or "thing(s)" referred to.
4. Many of the documents lack an alphanumerical system of identification (e.g., ORNL-6299). This and other shortcomings in cover-page information call for the reviewer's giving the typist specific information not indicated in the boxes at the top of the green sheet.

Special Lists of Keywords

The following two lists of keywords (Table 1) will help answer two very important questions for you as you keyword the document: What word indicates the kind of document under review? What word indicates the aspect of the analysis or treatment presented? In a sense, these lists represent two important modes of thinking for reviewers in these two categories of safety information. The hardware or thing words, and other keywords, can be found in either the master thesaurus or the keyword list (chart-form thesaurus), from which these two special lists were compiled.

Table 1. Special Keyword Lists

Kinds of Reports	Aspect of Analysis or Treatment
SAFETY EVALUATION	MATHEMATICAL TREATMENT
TECHNICAL SPECIFICATIONS	ANALOG SIMULATION
REPORT, PSAR	COMPUTER PROGRAM
REPORT, TRIP	ANALYTICAL MODEL
REPORT, SAR	EQUATION, GENERAL
REPORT, OPERATIONS	ECONOMIC STUDY
REPORT, OPERATIONS ANALYSIS	SYSTEM DESCRIPTION
REPORT, OPERATIONS SUMMARY	MATHEMATICAL STUDY
PATENT	CONGRESSIONAL ACTIVITY
ENGINEERING DRAWING LIST	DESIGN STUDY
BIBLIOGRAPHY	RADIATION, PUBLIC EDUCATION
	COMPARISON, THEORY AND EXPERIENCE
	PROCEDURES AND MANUALS
	SAFETY REVIEW
	REVIEW
	THEORETICAL INVESTIGATION

Examples of Typical Abstracts

As noted before, you will originate many more abstracts than you will copy or shorten. Nine typical examples are presented in this subsection, along with comments to help you decide what to say in each type:

1. the standard format for topical reports (see Chapter 11 for full discussion)
2. reports of incidents and failures
3. monthly operating reports

4. collections of papers from meetings
5. safety analysis reports and their amendments
6. responses to AEC questions about safety-analysis reports
7. generalized progress reports during a specific reactor's design stage
8. letters either received directly or as included in other publications
9. technical-specification changes

All examples shown are reproductions of computer output on SDI cards (Selected Dissemination of Information cards).

1. Topical Reports

Topical reports are handled in the customary way. See Chapter 11. Ordinarily the report will have an abstract, sometimes of the right length to suit our purposes, but some must be shortened. Or you may want to prepare an extract by lifting sentences from the document. The example below gives a good idea of what our subscribers want in an abstract.

```
                                  99-01    4                       06-17-69
   14412      RUBIN BF
EXAMINATION OF A FAILED ROD OPERATING WITH MOLTEN UO2-ZRO2-CAO FUEL
BETTIS ATOMIC POWER LABORATORY
WAPD-TM-593 +.  75 PAGES, 6 TABLES, 47 FIGURES, 11 REFERENCES,
 DECEMBER 1966

A FUEL ROD CONTAINING DISHED-END PELLETS OF ZRO2 PLUS 6.1 W/O CAO PLUS
 33.2 W/O UO2 RUPTURED AFTER 4.3 EFPD (30 HOURS) OPERATION IN THE ETR
 L-12 LOOP, AT 1.4 X 10 TO THE 6TH BTU/HR-FT2.  THE ROD OPERATED AT
 FULL POWER FOR 25 MIN AFTER FAILURE TOOK PLACE.  THE ROD WAS TO
 OPERATE WITH 50 PERCENT OF THE FUEL VOLUME WAS MOLTEN, EXTENDING
 WITHIN 31 MILS OF THE PELLET O.D.  DURING A SHUTDOWN, FUEL SHIFTED
 DOWN TO THE AXIAL FLUX MINIMUM, THE REGION OF FAILURE, THEN MOLTEN
 FUEL PENETRATED A RADIAL CRACK WITHIN THE PELLET AND MELTED THROUGH
 THE TUBING.  THE FUEL REACTED WITH STEAM, AND THE FUEL-SHEATH CONTACT
 CONDUCTANCE WAS REDUCED TO 1/6TH, WHEREUPON THE FUEL BECAME LOCALLY
 MOLTEN NEARLY TO THE PELLET OUTER DIAM.  INTENSIVE CLAD HYDRIDING
 TOOK PLACE FROM RADIOLYTIC DECOMPOSITION IN THE BOTTOM OF THE FUEL
 STACK, RESULTING IN A LONGITUDINAL CLAD RUPTURE ALONG THE BOTTOM
 SEVEN PELLETS.  IT IS CONCLUDED THAT OPERATION WITH SIGNIFICANT
 AMOUNTS OF MOLTEN ZRO2-CAO-UO2 FUEL MAY LEAD TO TUBING BURN-THROUGHS
 AND ROD FAILURES.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL
 INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF
 COMMERCE, SPRINGFIELD, VIRGINIA 22151, $3.00 COPY, $0.65 MICRONEGATIVE

*FAILURE, FUEL ELEMENT + REACTOR, TEST + HYDROGEN + FUEL SEGREGATION +
 EMBRITTLEMENT + *CENTERLINE MELTING + IN PILE LOOP + ETR (TR) +
 HEAT CONDUCTANCE, FUEL TO CLAD + *URANIUM DIOXIDE + *FAILURE, CLADDING
```

2. Reports of Incidents and Failures

In reports about incidents and failures, the important items are the usual ones: who, where, when, what, how, why, damage, and prevention of recurrence. The first three sometimes show in the title and name of the corporate author; but when they do not, they must be mentioned in the text. Also, when author-written titles are vague or misleading you can compensate for such defects in your abstracts. However, when titles are accurate and informative, do not repeat the same information in the abstract; use this room in the abstract for details. The example below shows how we handle this.

```
                                   99-01    9                    06-17-69

  15827      DISPLACED ENGINEERING TEST REACTOR FUEL ELEMENT
IDAHO OPERATIONS OFFICE, U. S. ATOMIC ENERGY COMMISSION
REACTOR OPERATING EXPERIENCE 67-2, 2 PAGES, FEBRUARY 27, 1967

THE REACTOR WAS TAKEN CRITICAL WITH ONE FUEL ELEMENT INSERTED ONLY 9
 IN., LEAVING THE ENTIRE FUELED PORTION ABOVE THE CORE.  ONE SHIFT
 LOGGED THE ELEMENT AS BEING PROPERLY SEATED, AND THE NEXT SHIFT
 CHECKED THE SEATING AS A PART OF THE PRE-STARTUP CHECK LIST.  THE
 CAUSE WAS ATTRIBUTED TO OPERATOR ERRORS.  THE POWER LEVEL NEVER
 EXCEEDED 1% OF FULL POWER, AND SCRAM WAS INITIATED FOLLOWING
 INABILITY TO EXPLAIN ROD-POSITION (REACTIVITY) DISCREPANCIES.

AVAILABILITY - AEC, DIVISION OF OPERATIONAL SAFETY, WASHINGTON, D. C.

*FAILURE, OPERATOR ERROR + REACTOR, TEST + ETR (TR) + FUEL HANDLING +
 *OPERATING EXPERIENCE SUMMARY + FAILURE, SEQUENTIAL +
 REACTIVITY EFFECT, ANOMALOUS + REACTOR, AEC OWNED +
 *INCIDENT, HUMAN ERROR
```

For the above incident, the title indicates who and where; the heading information implies when (1966); thus the abstract need tell only what happened and the extent of damage. Note that the abstract makes it clear that the administrative controls (checklists) were adequate and that this is a case of operator error. The solution to the problem should be made clear when adequate information is available in the document. Notice in the next abstract the concise description of a problem (accidental injection of liquid poison) and its solution.

```
                                       99-01    17                          06-17-69
  17397      BONUS POISON INJECTION, CONTROL ROD CALIBRATION
 PUERTO RICO WATER RESOURCES AUTHORITY
 20 PAGES, 3 FIGURES, 7 TABLES FROM DRL MONTHLY REPORT NO. 3, MARCH
  1967, DOCKET NO. 115-4, JULY 27, 1967

 (PAGE 3) 24 GAL OF LIQUID POISON WAS ACCIDENTLY INJECTED DURING A
  SYSTEM-OPERABILITY TEST.  TO LOWER THE BORON CONTENT IN THE REACTOR
  WATER, THE WATER SYSTEM WAS PARTIALLY DRAINED AND REFILLED WITH
  DEMINERALIZED WATER SEVERAL TIMES, AND DEMINERALIZERS WERE USED.
  (PAGE 14-16) DESCRIBES A XENON-TRANSIENT EXPERIMENT IN WHICH
  CONTROL-ROD BANKS WERE CALIBRATED USING THE XENON CHANGE IN THE CORE
  FOLLOWING POWER REDUCTION FROM 50 TO 14.5 MW IN 50 MIN BY INSERTING
  THE BLADE ROD BANK.

 AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

 REACTOR DYNAMICS + POISON, SOLUBLE + *XENON +
  *CONTROL ROD CALIBRATION + REACTIVITY EFFECT + REPORT, OPERATIONS +
  REACTOR, INTERNAL SUPERHEAT + BONUS (ISR) + REACTOR, BWR +
  TEST, PHYSICS + *SHUTDOWN SYSTEM, SECONDARY + *INCIDENT, HUMAN ERROR
```

Here, two incidents were reported on specific pages of an operating report. A specific title was coined for this selection - and the reactor name was included. In many instances the corporate author indicates the reactor in such a way that only the initiated reader can identify it, and sometimes the heading information on the report cover does not indicate the reactor name at all. Also, we do not have a specific keyword to identify many small research reactors, so a good way to indicate the reactor is to include the name in your coined title or in the abstract in adjectival form, as in the example. Try to avoid writing a separate sentence just to name the reactor.

The bulk of the abstract should treat the how, why, damage, and prevention of similar incidents. Ordinarily, no effort is needed to use the problem-solution-etc., type of internal labeling for abstracts about operational situations. Often, descriptive material is included to place the incident in context or perspective, or to show the significance of a failure which causes no damage. Added material which indicates opinion or guess is parenthesized and restricted to physical situations, as was done in accession 15827 - the first of the examples in this section on the incident-and-failure format.

3. Monthly Operating Reports

Since progress and monthly operating reports have a fairly standard format and content, fragments of significance are summarized in the NSIC abstract. Including page numbers minimizes searching in future study and also separates the fragments. This inclusion of page numbers results in an indexed abstract. The example below tells the literature searcher exactly where to start reading when he consults the document itself for the complete story.

99-01 15 06-17-69

17104 TABOR WH + HURT SS
SELECTED ORR OPERATING EXPERIENCE
OAK RIDGE NATIONAL LAB., TENN.
ORNL-TM-1843 +. 54 PAGES, 13 FIGURES, 17 TABLES OF OAK RIDGE RESEARCH REACTOR QUARTERLY REPORT, OCTOBER, NOVEMBER, AND DECEMBER OF 1966. APRIL 28, 1966

(PAGE 24) ALUMINUM SECTIONS OF AL-CD SHIM RODS WERE FOUND TO BE BOWED AS MUCH AS 38 MILS TOWARD THE HIGH-NEUTRON-FLUX REGION (DUE TO NEUTRON DAMAGE). (PAGE 39) TWO CONTAMINATION RELEASES OCCURRED, BOTH RELATED TO EXPERIMENTS, WITHOUT OVEREXPOSURES. TUNGSTEN-187 IN THE FORM OF OXIDE PARTICLES FROM A THERMOCOUPLE WAS SPILLED AND RESULTED IN CONTAMINATION THROUGHOUT THE BUILDING COMPLICATING CLEANUP OPERATIONS. THE SECOND RELEASE WAS XENON-138 FROM A FAILED FUEL ELEMENT EXPERIMENT. 12 HOURS AFTER THE RELEASE THE ACTIVITY DECAYED SUFFICIENTLY TO PERMIT UNRESTRICTED ACCESS TO THE BUILDING.

AVAILABILITY - CLEARINGHOUSE FOR FEDERAL SCIENTIFIC AND TECHNICAL INFORMATION, NATIONAL BUREAU OF STANDARDS, U. S. DEPARTMENT OF COMMERCE, SPRINGFIELD, VIRGINIA, $3.00 COPY, $0.65 MICROFICHE

INSTRUMENT, TEMPERATURE + REACTOR, TEST + REACTOR, RESEARCH + CONTROL ROD BURNUP + *REPORT, OPERATIONS + INCIDENT, GENERAL + OPERATING EXPERIENCE SUMMARY + ALUMINUM + RADIATION DAMAGE + ORR (RR) + IN PILE EXPERIMENT + CORE COMPONENTS + FAILURE, SCRAM MECHANISM + NEUTRON + REACTOR, AEC OWNED + RADIOACTIVITY RELEASE

Where nothing of particular significance is apparent, a master-series abstract is used, as follows:

```
                                   99-01   14                  06-17-69
   16767      PEACH BOTTOM MONTHLY OPERATIONS REPORT NUMBER 11, JANUARY
   1967
  PHILADELPHIA ELECTRIC COMPANY, PHILADELPHIA
  27 PAGES, 2 TABLES, JANUARY 1967, DOCKET NO. 50-171

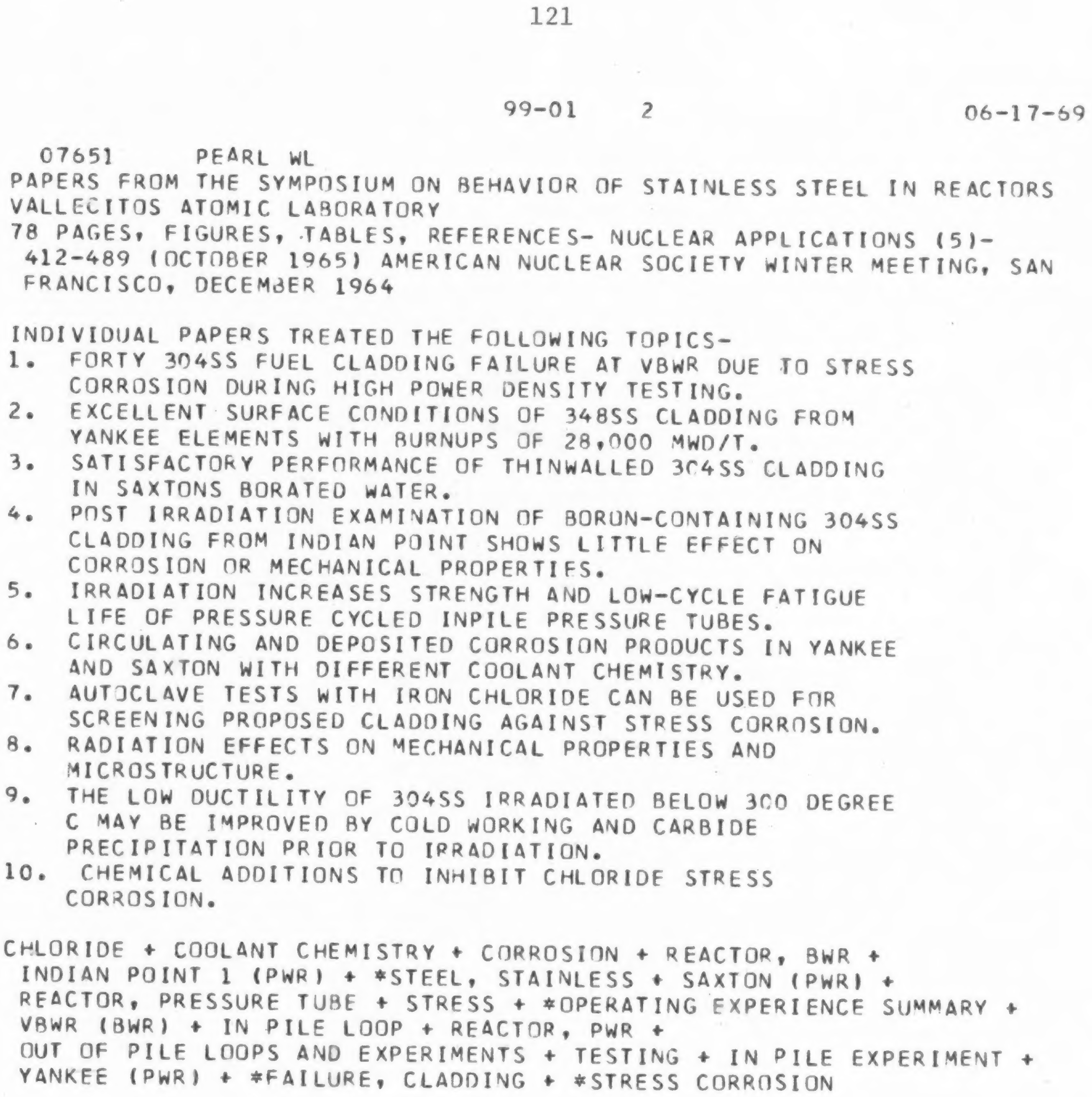
  THIS PROGRESS REPORT IS ONE OF A SERIES WHOSE USUAL CONTENT IS -
   OPERATIONS, HEALTH PHYSICS AND CHEMISTRY, MAINTENANCE, CHANGES TO THE
   FACILITY, RESULTS OF SIGNIFICANT TESTS, AND ADMINISTRATION.

  AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

  REPORT, OPERATIONS + REACTOR, GCR + PEACH BOTTOM 1 (HTGR) +
   REPORT, OPERATIONS SUMMARY
```

4. Collections of Papers from a Meeting or List of Items

The following format is used where each paper may be insignificant but where a compilation may represent a state-of-the-art report. This is called the table-of-contents format (descriptive abstract).



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                                121

                                99-01    2                    06-17-69
  07651      PEARL WL
 PAPERS FROM THE SYMPOSIUM ON BEHAVIOR OF STAINLESS STEEL IN REACTORS
 VALLECITOS ATOMIC LABORATORY
 78 PAGES, FIGURES, TABLES, REFERENCES- NUCLEAR APPLICATIONS (5)-
  412-489 (OCTOBER 1965) AMERICAN NUCLEAR SOCIETY WINTER MEETING, SAN
  FRANCISCO, DECEMBER 1964

 INDIVIDUAL PAPERS TREATED THE FOLLOWING TOPICS-
 1.   FORTY 304SS FUEL CLADDING FAILURE AT VBWR DUE TO STRESS
      CORROSION DURING HIGH POWER DENSITY TESTING.
 2.   EXCELLENT SURFACE CONDITIONS OF 348SS CLADDING FROM
      YANKEE ELEMENTS WITH BURNUPS OF 28,000 MWD/T.
 3.   SATISFACTORY PERFORMANCE OF THINWALLED 304SS CLADDING
      IN SAXTONS BORATED WATER.
 4.   POST IRRADIATION EXAMINATION OF BORON-CONTAINING 304SS
      CLADDING FROM INDIAN POINT SHOWS LITTLE EFFECT ON
      CORROSION OR MECHANICAL PROPERTIES.
 5.   IRRADIATION INCREASES STRENGTH AND LOW-CYCLE FATIGUE
      LIFE OF PRESSURE CYCLED INPILE PRESSURE TUBES.
 6.   CIRCULATING AND DEPOSITED CORROSION PRODUCTS IN YANKEE
      AND SAXTON WITH DIFFERENT COOLANT CHEMISTRY.
 7.   AUTOCLAVE TESTS WITH IRON CHLORIDE CAN BE USED FOR
      SCREENING PROPOSED CLADDING AGAINST STRESS CORROSION.
 8.   RADIATION EFFECTS ON MECHANICAL PROPERTIES AND
      MICROSTRUCTURE.
 9.   THE LOW DUCTILITY OF 304SS IRRADIATED BELOW 300 DEGREE
      C MAY BE IMPROVED BY COLD WORKING AND CARBIDE
      PRECIPITATION PRIOR TO IRRADIATION.
 10.   CHEMICAL ADDITIONS TO INHIBIT CHLORIDE STRESS
      CORROSION.

 CHLORIDE + COOLANT CHEMISTRY + CORROSION + REACTOR, BWR +
  INDIAN POINT 1 (PWR) + *STEEL, STAINLESS + SAXTON (PWR) +
  REACTOR, PRESSURE TUBE + STRESS + *OPERATING EXPERIENCE SUMMARY +
  VBWR (BWR) + IN PILE LOOP + REACTOR, PWR +
  OUT OF PILE LOOPS AND EXPERIMENTS + TESTING + IN PILE EXPERIMENT +
  YANKEE (PWR) + *FAILURE, CLADDING + *STRESS CORROSION
```

When a list of items is made (for example, a listing of chapters in a book), the above table-of-contents format is not used; instead, parentheses are used to indicate the subdivisions. This also is an indexed descriptive abstract. The following abstract shows how to handle facts or ideas which are important enough to deserve enumeration.

```
                              122

                          99-01   20                    06-17-69
  22236      ACRS REPORT ON DIABLO CANYON
U.S. ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.
5 PAGES, 11 REFERENCES, DOCKET 50-275, TYPE--PWR, MFG--WEST, AE--PG+E,
 DECEMBER 20, 1967

ACRS BELIEVES THAT THE FOLLOWING 6 ITEMS PERTAIN TO ALL LARGE
 WATER-COOLED POWER REACTORS - (1) THERMAL SHOCK EFFECT OF COLD WATER
 INJECTION IN LOSS-OF-COOLANT ACCIDENT, (2) EFFECT OF BLOWDOWN FORCES
 ON CORE AND PRIMARY SYSTEM COMPONENTS, (3) EFFECT OF FUEL FAILURES ON
 EMERGENCY COOLING ABILITY. (4) INDEPENDENCE OF CONTROL AND
 PROTECTION INSTRUMENTATION--PRESENT DESIGN INADEQUATE, (5) PROMPT
 DETECTION OF GROSS FUEL FAILURE, (6) PRIMARY-SYSTEM QUALITY CONTROL
 AND IN-SERVICE INSPECTION.  *** FIXED POISON (BOROSILICATE GLASS)
 DURING FIRST CYCLE TO ENSURE NEGATIVE MODERATOR COEFFICIENT NEEDS
 MORE PERFORMANCE DATA.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*THERMAL MECHANICAL EFFECT + CONTROL ROD PROGRAM + REACTOR, PWR +
 MODERATOR COEFFICIENT + INSTRUMENT, DETECTION FAILED FUEL ELEMENT +
 FAILURE, FUEL ELEMENT + ACCIDENT, LOSS OF COOLANT + ACRS +
 PLANT PROTECTIVE SYSTEM + *PRESSURE VESSEL + DIABLO CANYON 1 (PWR) +
 INDEPENDENCE + POISON, FIXED + *BLOWDOWN + CORE REFLOODING SYSTEM +
 EMERGENCY COOLING CONSIDERATIONS
```

When preparing a descriptive abstract using a book's chapter heading, for example, include the number of pages in the chapter, if possible, to give the reader an idea of the scope and depth of the chapters. This is called an indexed, scoping abstract. In the example below, notice that the reader would not only get a good idea of the scope and depth of the chapters but he would learn that the manual is intended for early-stage training. This is the kind of information that helps our subscribers decide whether they can use a given training manual.

```
                              99-01   19                      06-17-69

  18733      HANLEN DF + HAMILTON GN + TAYLOR EG
REACTOR OPERATOR TRAINING MANUAL
WESTINGHOUSE ELECTRIC CORPORATION, ATOMIC POWER DIVISION, PITTSBURGH,
 PA.
WCAP-2713 +.  378 PAGES, 67 FIGURES, 14 TABLES, 31 REFERENCES, DEC.
 1964

PRESENTLY BEING UPDATED.  INTENDED FOR USE IN EARLY STAGES OF OPERATOR
 TRAINING, EXAMPLES SLANTED TO POWER REACTORS BUT USEFUL FOR ALL
 REACTORS.  CHAPTERS - ATOMIC PHYSIC (23 P), NUCLEAR PHYSIC (29 P),
 REACTOR PHYSICS (46 P), NUCLEAR TECHNOLOGY (42 P), INSTRUMENTATION
 AND CONTROL (65 P), AND NUCLEAR SAFETY (35 P).  APPENDIXES CONTAIN 3
 TYPICAL AEC EXAMINATIONS (OP., PWR) (SRO, TEST REACTOR) (SRP, CRIT.
 FAC.), SAMPLE REACTOR-PHYSICS CALCULATIONS, AND A GLOSSARY OF
 TECHNICAL TERMS AND SLANG.  DISCUSSION OF OPERATIONS AT GOOD
 PRACTICAL LEVEL.

AVAILABILITY - WESTINGHOUSE ELECTRIC CORPORATION, ATOMIC POWER
 DIVISION, P. O. BOX 355, PITTSBURGH, PA.

REACTOR, PWR + INSTRUMENT, GENERAL + *PROCEDURES AND MANUALS +
 *TRAINING + REACTOR, POOL TYPE + REACTOR PHYSICS
```

5. Safety Analysis Reports and Their Amendments

Since each safety-analysis report could legitimately contain sections calling for the use of many keywords, we use only keywords relating to the specific reactor and type. Should any system or analysis have a particular significance, keywords may so indicate. The abstract is intended only to describe the plant well enough so a reader may determine if he is interested in the reactor. Each volume is an accession, and this is clearly indicated in the opening sentence of each abstract. This helps our readers get complete collections of volumes.

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                              99-01    6                   06-17-69

  15674     SURRY POWER STATION UNITS 1 AND 2 PRELIMINARY SAFETY
 ANALYSIS REPORT, PART B
VIRGINIA ELECTRIC AND POWER COMPANY
170 PAGES, FIGURES, TABLES, 1967, DOCKET NO. 50-280 AND 50-281

VOLUME 1 CONTAINS THE FOLLOWING CHAPTERS - (1) INTRODUCTION, (2) SITE,
 AND (3) REACTOR.  A TABLE COMPARES 152 SIGNIFICANT DATA ITEMS WITH
 INDIAN POINT 2 AND BURLINGTON 1.  AEC CONSTRUCTION PERMIT CRITERIA
 ARE DISCUSSED, AND SHARED FACILITIES ARE NOTED.  CONDENSER COOLING
 WATER IS LIFTED FROM DOWNSTREAM SIDE OF SITE TO AN INTAKE CANAL
 (PROVIDING A SOURCE OF WATER FOR EMERGENCIES) AND FLOWS BY GRAVITY
 THROUGH THE CONDENSERS TO THE UPSTREAM SIDE OF THE SITE.  SEPARATE
 METEOROLOGY REPORT (NUS-333, DECEMBER 66).  FAULT FORMATIONS END 50
 MILES FROM SITE.  REACTOR EVALUATED FOR 2546 MW(TH), WHICH
 CORRESPONDS TO FULL TURBINE RATING OF 846 MW(E).  LENGTHY DISCUSSION
 OF REACTIVITY AND DNB CALCULATIONAL METHODS.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

REACTOR, PWR + ANALYTICAL MODEL + REACTIVITY EFFECT +
 AEC DESIGN CRITERIA + SURRY 1 (PWR) + *REPORT, PSAR + DNB +
 EMERGENCY COOLING CONSIDERATIONS
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                              99-01    7                   06-17-69

  15675     SURRY POWER STATION UNITS 1 AND 2 PRELIMINARY SAFETY
 ANALYSIS REPORT, VOLUME 2, PART B
VIRGINIA ELECTRIC AND POWER COMPANY
200 PAGES, FIGURES, TABLES, 1967, DOCKET NO. 50-280 AND 50-281

VOLUME 2 CONTAINS THE FOLLOWING CHAPTERS - (4) REACTOR COOLANT SYSTEM,
 (5) CONTAINMENT, (6) ENGINEERED SAFEGUARDS, (7) INSTRUMENTS AND
 CONTROLS, (8) ELECTRICAL SYSTEMS.  EACH CONTROLLED-LEAKAGE PC PUMP
 HAS A FLYWHEEL.  A NEW CONTAINMENT CONCEPT (SUBATMOSPHERIC) IS
 ADVANCED, WHERE A VACUUM PUMP DISCHARGES CONTAINMENT AIR THROUGH
 FILTERS TO THE STACK, TO MAINTAIN CONTAINMENT AT 10 PSIA BEFORE AND
 AFTER AN ACCIDENT.  DESIGN IS FOR 45 PSIG AT 280 F.  ENGINEERED
 SAFEGUARDS ARE - (1) THREE ACCUMULATORS, HIGH- AND LOW-HEAT
 WATER-INSPECTION PUMPS, (2) RECIRCULATION OF SPILLED WATER, (3)
 CONTAINMENT SPRAY, (4) RECIRCULATION OF CONTAINMENT-SPRAY WATER, (5)
 CONTAINMENT (SUBATMOSPHERIC) VACUUM SYSTEM.

AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

*CONTAINMENT, LOW PRESSURE + REACTOR, PWR + ENGINEERED SAFETY FEATURE +
 SURRY 1 (PWR) + *REPORT, PSAR
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                                   125

                                   99-01     8                    06-17-69
  15676      SURRY POWER STATION UNITS 1 AND 2 PRELIMINARY SAFETY
  ANALYSIS REPORT VOLUME 3, PART B
 VIRGINIA ELECTRIC AND POWER COMPANY
 175 PAGES, FIGURES, 1967, DOCKET NO. 50-280 AND 50-281

 VOLUME 3 CONTAINS THE FOLLOWING CHAPTERS - (9) AUXILIARY AND EMERGENCY
  SYSTEM, (10) STEAM SYSTEMS, (11) WASTE AND RADIATION PROTECTION, (12)
  ORGANIZATION, (13) INITIAL TESTS, AND (14) SAFETY ANALYSIS.  GRAVITY
  FLOW FROM INTAKE CANAL PROVIDES 24-HR SUPPLY OF COOLING WATER TO
  RECIRCULATION-SPRAY HEAT EXCHANGERS.  CHAPTER 14 IS MAINLY A
  LOSS-OF-COOLANT BLOW-DOWN ANALYSIS.  ONLY HYPOTHETICAL ACCIDENTS ARE
  REPORTED (CORE MELTDOWN RELEASES TO CONTAINMENT 100% OF THE NOBLE
  GASES, 50% OF THE HALOGEN, 1% OF THE OTHER FISSION PRODUCTS.  50%
  IODINE PLATEOUT.  CONTAINMENT LEAKAGE AT 0.125%/DAY.)  TWO ANALYSES
  WERE PERFORMED - (1) LEAKAGE IS TERMINATED AFTER 35 MIN BY
  SUBATMOSPHERIC CONTAINMENT PRESSURES.  MAXIMUM THYROID DOSE IS 264
  REMS.  WHOLE-BODY DOSE IS 3.9 REMS AT SITE BOUNDARY.  (2) ASSUMING NO
  SAFEGUARDS OPERATIONAL AND THE LEAKAGE LASTS 30 DAYS, SITE BOUNDARY
  DOSES IS 900 REMS, BUT POPULATION CENTER DOSE IS WELL BELOW 10 CFR
  100 VALUE.

 AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, WASHINGTON, D.C.

 HEAT SINK + CONTAINMENT SPRAY + REACTOR, PWR + ACCIDENT, HYPOTHETICAL +
  SURRY 1 (PWR) + BLOWDOWN + *REPORT, PSAR
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Amendments are given a similar treatment. Usually, amendments are either revised PSAR pages or responses to AEC questions, or a mixture. All amendments are given the keyword AEC QUESTION and an indicative abstract. For more on the indicative abstract, see Chapter 11. The following abstract of an amendment is a good example of how they are to be written.

126

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                          99-C1   10                    06-17-69
X
   16328      DRESDEN NUCLEAR POWER STATION.  UNIT 3 AMENDMENT 1,
  ANSWERS TO AEC QUESTIONS
 COMMONWEALTH EDISON COMPANY
 86 PAGES, FIGURES, TABLES, 1966, DOCKET NO. 50-249

 AMENDMENT 1 CONTAINS ANSWERS TO 34 QUESTIONS ASKED BY DLR IN A LETTER
  DATED APRIL 21, 1966.  ALSO, CHANGES AND ADDITIONS TO THE PLANT
  DESIGN AND ANALYSIS REPORT (PSAR) ARE INCLUDED.  (A) GENERAL, (B)
  STATION DESIGN, (C) ENGINEERED SAFEGUARDS, (D) SAFETY EVALUATION, (E)
  INSTRUMENTATION.

 AVAILABILITY - USAEC, PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

 AEC QUESTION + REACTOR, BWR + DRESDEN 3 (BWR) + REPORT, PSAR
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6. Responses to AEC Questions About Safety-Analysis Reports

The preparation of abstracts about responses to AEC questions evolved from the original indicative abstract. Each question is treated individually, and the answer is either summarized or its length indicated. Indicating the length of the answer is usually restricted to cases where it is impossible to compress the answer or extract a significant bit; yet, this tells the reader of the abstract that the question has indeed been answered. Note that the answer is clearly indicated, thus separating it from the question.

99-01 21 06-17-69

22759 RESPONSE TO QUESTION 23 - REINFORCEMENT OF CONTAINMENT PENETRATIONS
OMAHA PUBLIC POWER DISTRICT
1 PAGE, PAGE 23.-1 OF AMENDMENT 6 TO THE LICENSE APPLICATION (SUPPLEMENT 6 TO FORT CALHOUN FACILITY DESCRIPTION AND SAFETY ANALYSIS REPORT), OCT. 4, 1967, EXHIBIT F6 OF DOCKET 50-285, TYPE--PWR, MFG--C.E., AE--GIBBS + HILL

GIVE THE GENERAL METHODS OF REINFORCING PENETRATIONS TO ENSURE THAT PIPE RUPTURES WILL BE WITHSTOOD BY PENETRATIONS. (ANSWER) PIPING WILL BE ANCHORED INTO WALL. INCREASED PIPE THICKNESS, PIPE STOPS, OR OTHER MEANS WILL BE USED TO MAKE PENETRATION THE STRONGEST POINT. HIGH-PRESSURE PIPE WILL ENGAGE WALL WELL ENOUGH TO RESIST SHEARS AND MOMENTS FROM PIPE RUPTURE.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

FAILURE, PIPE + *INTEGRITY + REACTOR, PWR + *CONTAINMENT PENETRATION, PIPE + REPORT, PSAR + RESPONSE TO AEC QUESTION + SUPPORT STRUCTURE + *STRUCTURAL INTEGRITY + FT. CALHOUN (PWR)

99-01 23 06-17-69

23959 RESPONSE TO QUESTION 12.9 - FUEL INTEGRITY
OMAHA PUBLIC POWER DISTRICT
6 PAGES, 8 REFERENCES, PAGE 12.9-1 THRU 12.9-6 OF AMENDMENT 5 TO THE LICENSE APPLICATION (SUPPLEMENT 3 TO THE FORT CALHOUN UNIT 1 FACILITY DESCRIPTION AND SAFETY ANALYSIS REPORT), SEPT. 26, 1967, EXHIBIT F5 OF DOCKET 50-285, TYPE--PWR, MFG--C.E., AE--GIBBS + HILL

WHAT EVIDENCE IS AVAILABLE TO INDICATE THAT THE FUEL WILL WITHSTAND EXPECTED TRANSIENTS TOWARD THE END OF ITS ANTICIPATED LIFETIME. (ANSWER ON PAGES 12.9-1 THRU -6.)

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

FUEL BURNUP + *DESIGN CRITERIA + REACTOR, PWR + *FUEL INTEGRITY + *FUEL ELEMENT + STRESS + REPORT, PSAR + RESPONSE TO AEC QUESTION + EXPANSION + FT. CALHOUN (PWR) + FAILURE, CLADDING

7. Generalized Progress Reports Issued During the Design Stage of a Reactor

Treatment is almost identical to that for a monthly operating report. A master-series lists the subject headings of the program, and each subsequent report is either given this abstract or significant items are summarized.

8. Letters Either Received Directly or as Included in Another Publication

Since the standard-heading format makes no provision for recipient of a letter, the reviewer must write in the words "letter to . . .", naming the addressee and his company. These words are placed in the report-number box on the green sheet.

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                                    99-01   22                    06-17-69

  23812      MORRIS PA
DRL RECOMMENDS EARTHQUAKE ACCELERATION FOR ZION
AEC, DIVISION OF REACTOR LICENSING, WASHINGTON, D. C.
LETTER TO W. B. BEHNKE, COMMONWEALTH EDISON CO., CHICAGO, ILLINOIS, 1
 PAGE, FEBRUARY 21, 1968, DOCKET NO. 50-295/304, TYPE--PWR,
 MFG--WEST., AE--SGT + LUNDY

U.S. COAST AND GEODETIC SURVEY RECOMMENDS, WITH DRL AND USGS
 CONCURRING, THAT AN ACCELERATION OF 0.08 G IS ADEQUATE FOR LIKELY
 EARTHQUAKES, AND 0.17 G IS THE MAXIMUM GROUND ACCELERATION FOR DESIGN
 FOR SAFE SHUTDOWN.  DRL UNDERSTANDS THAT AN AMENDMENT WILL BE FILED
 ON THIS BASIS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

REACTOR, PWR + *DESIGN CRITERIA + *EARTHQUAKE ENGINEERING +
 ZION 1 (PWR)
```

When Atomic Energy Clearinghouse is the source of the letter, standard format requires attribution to AECH, using its date. Thus the abstract carries the burden of identifying recipient and date. See below how this is handled.

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                                    99-01   11                         06-17-69

  16366     BABCOCK AND WILCOX, MT. VERNON INDIANA, CITED FOR NON
 COMPLIANCE UNDER LICENSE 13-11317-1
BABCOCK AND WILCOX, MT. VERNON, IND.
2 PAGES, ATOMIC ENERGY CLEARING HOUSE 13(24) PAGES 13-14 (JUNE 12,
 1967)

(LETTER FROM DIV. COMPLIANCE, APRIL 17, REGARDING FEB. 16 INSPECTION,
 APPARENTLY RELATING TO A RADIOGRAPHY INCIDENT ON OCT. 10, 1966) - A
 SURVEY WAS NOT MADE AFTER EACH FILM EXPOSURE TO CHECK THE 141-CURIE
 CO-60 WAS RETURNED TO THE SHIELD.  AN INADEQUATE EVALUATION WAS MADE
 OF DOSE RECEIVED.  THE WARNING SYSTEM WAS A BUZZER ACTIVATED UPON
 ENTRY TO RADIOGRAPHY ROOM, AND WAS NOT RELATED TO RADIATION LEVEL.
 (B AND W REPLY, MAY 3) - PROPER SURVEY WAS NOT MADE.  DOSE REPORTED
 NOV. 3 WAS CALCULATED IN GOOD FAITH, HOWEVER FURTHER INFORMATION
 REPORTED DURING INSPECTION OF FEB. 16 DOES INDICATE AN 8-R CALCULATED
 DOSE TO UPPER BODY, 3.7-R FILM-BADGE DOSE TO WAIST, AND 27.7/36.6-R
 CALCULATED DOSE TO L/R HANDS.  INCIDENT OCCURRED BECAUSE OF EMPLOYEE
 PREOCCUPATION WITH PERSONAL MATTERS.  WARNING ALARM IS TYPICAL OF
 THOSE IN OTHER INSTALLATIONS, COMPLIES WITH OUR INTERPRETATION OF 10
 CFR 20, AND SHOULD REMAIN AS IS.  WE HAVE CHANGED FROM A BELL TO A
 HORN, AND HAVE POSTED AN AUTHORIZED-ENTRY-ONLY SIGN.

*COMPLIANCE + DOSE CALCULATION, EXTERNAL + DOSE MEASUREMENT, EXTERNAL +
 FAILURE, OPERATOR ERROR + *INCIDENT, HUMAN ERROR +
 FAILURE, DESIGN ERROR + PERSONNEL EXPOSURE, RADIATION + *RADIOGRAPHY
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9. <u>Technical-Specification Changes</u>

In general, these are in the direct-letter format and bear the keyword TECHNICAL SPECIFICATIONS. Care must be taken to indicate whether the technical specification is the <u>proposed</u> or the <u>final</u> version. License and authorization amendments are treated as if they were changes to an actual technical specification. The three abstracts below are typical.

99-01 13 06-17-69

16764 UNIVERSITY OF MISSOURI (COLUMBIA) CHANGE 3 APPROVED BY DRL
UNITED STATES ATOMIC ENERGY COMMISSION, WASHINGTON, D. C.
3 PAGES, JULY 11, 1967, DOCKET NO. 50-186

LETTERS APRIL 19 AND JUNE 7 REQUESTED (1) FUEL-FAILURE-MONITOR OPERATION BE SUSPENDED BELOW 100 KW DURING NATURAL CONVECTION FLOW, (2) REVISION OF MINIMUM COUNT RATE FROM 2 COUNTS/SEC OR A 1/2-DECADE DEFLECTION TO 1 COUNT/SEC VS 1 DECADE, (3) REDUCE REFLECTOR FLOW REQUIREMENTS TO AGREE WITH MEASUREMENTS.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

*TECHNICAL SPECIFICATIONS + INSTRUMENT, DETECTION FAILED FUEL ELEMENT + REACTOR, RESEARCH + UMRR (RR) + REFLECTOR + SAFETY EVALUATION + FLOW DISTRIBUTION + REACTOR, FLUX TRAP + INSTRUMENT, STARTUP RANGE

99-01 12 06-17-69

16412 LICENSING CHANGES FOR CVTR DECOMMISSIONING.
CAROLINAS VIRGINIA NUCLEAR POWER ASSOCIATES, INC., PARR, S. C.
27 PAGES, JUNE 1967, DOCKET NO. 50-144, AMENDMENT 2

FUEL WILL BE PLACED IN STORAGE BASINS TEMPORARILY. HEAVY WATER IS BEING DRAINED. THE CHANGED LICENSE IS EFFECTIVE UNTIL 27 NOV. 67, WHEN A FINAL BY-PRODUCT LICENSE WILL BE CONSIDERED FOR THE REMAINING MATERIAL. NEW TECHNICAL SPECIFICATIONS FOR DECOMMISSIONING PROCESS ENCLOSED.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C.

REACTOR, HWR + REACTOR, PRESSURE TUBE + CVTR (PWR) + REACTOR, PWR + *TECHNICAL SPECIFICATIONS + *SAFETY EVALUATION + DECOMMISSIONING

18454 PLUM BROOK PROPOSED CHANGE 32. PENETRATION LEAK RATE, MAXIMUM FUEL BURNUP, AND CONTROL ROD DRIVES GUIDE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, SANDUSKY, OHIO
5 PAGES, SEPTEMBER 7, 1967, DOCKET 50-30

(1) REQUESTS LONGER (YEARLY) LEAK-TEST INTERVAL ON UNMONITORED PENETRATIONS ON BASIS OF PAST EXPERIENCE. *** (2) INCREASE ALLOWED BURNUP FROM 100 TO 113 MWD ON BASIS OF OBSERVATION AT ORNL, WHERE 240 G ELEMENTS WERE DEPLETED TO 96 G U-235. *** (3) MODIFICATION OF CONTROL-ROD DRIVES TO PERMIT A PLANNED MODIFICATION OF CORE UPPER GRID (DIVIDING IT INTO 2 PARTS) TO FACILITATE RELOADING. ROLLER BEARING WILL BE REPLACED BY ROLLERLESS GUIDES.

AVAILABILITY - USAEC PUBLIC DOCUMENT ROOM, WASHINGTON, D. C. 20432

OPERATING EXPERIENCE SUMMARY + REACTOR, TEST + REACTOR, RESEARCH + MODIFICATION, SYSTEM OR EQUIPMENT + TEST, LEAK RATE + *FUEL BURNUP + *CONTROL ROD DRIVE + TECHNICAL SPECIFICATIONS + PLUM BROOK (TR) + *TEST INTERVAL + *CONTAINMENT PENETRATION, ELECTRICAL + SUPPORT STRUCTURE

Suggested Literary Style for Reviewer-Originated Abstracts

As to the literary style of the abstracts, a good bit was said in Chapter 11 about getting the most from 100 words (125 in some cases). We will say a little more here, mainly about the sometimes unappreciated advantages of single, long sentences over a collection of short ones, especially when you must crowd quite a few facts and ideas into your abstracts or want to speed up the reader's pace.

Here is a short-sentence example of what might go into an abstract: "A good safety program has several factors. The men themselves must be taught to think about personal safety. All machines must be thoroughly guarded. Vision must be unobstructed. Standard color codes must identify all dangerous objects, radioactive or not." The meaning is clear, and the upper limit on words is not in question; but the sentence rhythm is somewhat jerky.

Here is a long-sentence version of the same example: "In a good safety program, workers are taught to think of personal safety, machines have guards, vision is unobstructed, and standard color codes identify all dangerous objects, radioactive or not." Not only does this sentence quicken the reader's pace, but it has nine fewer words in it, some of which were superfluous to begin with. Often, a single sentence, characterized by the comma-series construction, works better than a collection of sentences.

Consider the following collection of short sentences, which is characterized by too many transitions (in this instance, connections made by using the end of one sentence to start the next): "Author presents an analysis of containment design. This analysis includes a sensitivity analysis. This sensitivity analysis was verified by a computation on a presently successful design."

Now to the long-sentence version (not the comma-series type): "Analyzes containment design, including a sensitivity analysis verified by a computation on a presently successful design." Here, ten words were cut out (about 40%), and the reading speed was quickened. Besides, a number of such sentences would let you pack a 100-word abstract with useful information.

The above examples are not intended to imply that there is something basically wrong with short sentences. There is not. The examples were intended to show that, sometimes, use of the long sentence can eliminate superfluous words and also set a better reading pace for the literature searcher. For these reasons, you are encouraged to have second thoughts about the several virtues of short sentences when you prepare your abstracts.

Summarizing, some of your abstracts will call for long sentences; others will not, depending on how many facts or ideas you have to pack into the little space allotted on the print-out card. We try to avoid two-card print-outs. If you are careful in casting your sentences, grammar will not have to yield to geometry very often.

APPENDIX B

STYLE POINTS

The title of this section, "Style Points," may be misleading because we are dealing with "conformity points." We are merely trying to conform to the limitations of the print-out typewriter at the computer center. That typewriter may been seen as one that cannot print superscripts, subscripts, Greek letters, and a few other common symbols. Also, it cannot handle colons, semicolons, apostrophes, or question marks, which limits us to the use of periods, commas, and hyphens.

The style points are shown below. Undoubtedly, you can add to the list.

HOW TO HANDLE GREEK LETTERS, UNITS, RATINGS, CHEMICAL AND MATHEMATICAL SYMBOLS, ETC.

Use the Following:	Do Not Use This:
about	~
alpha (spell out all Greek letters)	α
anti K	$\overline{K}$
average delta	$\overline{\Delta}$
beta	β
B-11 (p,n, gamma) C-11 reaction	$B^{11}(p,n,\gamma)C^{11}$ reaction
cents	¢
cc or cu. cm., depending on whether the slight difference between a cc and a cm^3 figures in the case	cm^3
cu. m or cu. ft, etc.;	m^3 or ft^3, etc.
delta k/k	$\Delta k/k$
equal to or greater (less) than	$\geq$, $\leq$
gamma	γ
greater (less) than	>, <
H2O, U3O8, etc.	H_2O, U_3O_8, etc.
megacurie(s)	MCi (print-out [illegible]e cannot print capital M)
megawatt(s)	MW; may use MW [illegible] meaning is clear, as in 500 MW(e) [illegible] reactor; otherwise, spell out

microcurie(s)	µCi
microcuries (millicuries or megacuries)/gal	µCi/gal, mCi/gal, or MCi/gal
millicurie(s)	mCi
milliwatts, millivolts, etc.	mW, mV, etc.
omega-sub-n-squared, etc.	ω_n^2, etc.
Pi squared, etc.	π^2, etc.
%	percent
+-	±
450 F, etc.	450°F, etc.
45-deg angle, etc.	45° angle, etc.
1 x 10(5th), etc.	1×10^5, etc.
1 x 10(-5th), etc.	1×10^{-5}, etc.
(Note: for number in the 100 to 10,000 range, do not use exponents; same for decimal fractions in the 0.01-0.0001 range)	

Punctuation: How to Indicate Paragraphs

Punctuation marks are limited to commas, periods, and hyphens, so:

For a colon, use "space-hyphen-space," indicated as follows: #-#

For a semicolon, use a period and start a new sentence

For an apostrophe, as in "Sutton's formula," close up the "s" to the base word even though this pluralizes the word

For a question mark, use a period

For punctation marks, use (quote) and (unquote): (quote) A mechanical failure caused the . . . .(unquote)

To indicate paragraphs, use three stars or asterisks, and continue typing or writing on the line.

APPENDIX C

DETAILS OF THE NSIC THESAURUS AND THE DICTIONARY

The following information could have been put in either Part 1 or 2 of the report, but since it is of equal importance to both reviewer and editor, it seemed best to present the details of the thesaurus and the dictionary in an Appendix. Included also are brief remarks about the "post-on" list (used by the secretaries) and instructions to help the editor keep the computer-center thesaurus up to date.

The Thesaurus and the Post-On List

The thesaurus now (August 1968) contains about 1750 keywords and many cross references and synonyms. It is issued periodically in two forms: book form, which also contains the synonyms and cross references; and chart form, which contains keywords only. We call the book type the master thesaurus, and the chart type the keyword list.

The synonyms and cross references are useful because they extend the list of keywords without adding new ones. (See examples and comments, pages 138 to 143.) Reviewers are encouraged to spot useful synonyms and cross references as they review their documents and then submit them for inclusion in the master thesaurus.

We make some concession toward indicating broad-term/narrow-term relationships in the master thesaurus. However, we include such related terms in the dictionary, where we also indicate terms for which the one in question might be mistaken. From time to time, these will be included in the master thesaurus. Right now, the book-type thesaurus stresses relationships between reactors and classes of reactors (reactor-specific/reactor-generic keywords), but this merely shows hierarchical distinctions among "things".

The chart-type thesaurus is a very handy reference because it presents all the keywords on one large page. As noted above, no cross references or related terms are shown on it. Reviewers prefer it to the book type and use the book only when looking for a cross reference or synonym that might lead them to a keyword. The layout of the chart (see) examples on pages 145 and 147) has had a lot to do with improved keywording because all the words are in plain view, making it easy for reviewers to find the words they need. In addition, the reviewers can spot newly added keywords and words that still need definitions. Altogether, the chart has done much to improve keywording and to save time and energy for the reviewers.

The post-on list is a special thesaurus distributed among the secretaries, showing relationships between reactors and reactor types. Since some reactors have as many as four post-ons, the reviewer is asked to add only the first, and the secretary adds the others when she prepares the typescripts of his green sheets. See pages 148 and 149 for post-ons.

To help a new reviewer get started, we provide him with a "starter" list of most commonly used keywords for his category. For example, the starter list for Category 6 (Reactor Transients, Kinetics, and Stability) contains 50 keywords. These lists do not include very many "thing" words, which are conveniently blocked out on the chart-form thesaurus. Each reviewer is asked to add needed keywords (taken from the chart) to his list, which is given to the next reviewer, helping him get off to a faster start.

Such starter lists of keywords are not given to those who review documents in Categories 17 and 18. Rather, they use a short list that contains keywords that denote the kind of document (SAFETY EVALUATION, for example) and aspect of analysis or treatment (SYSTEM DESCRIPTION, for instance). This special list is in Appendix A. No starter list in the usual sense could be prepared for those who work with information in Categories 17 and 18 because the information in the documents often spills over significantly into many of the other categories. This means that those reviewers must use the entire thesaurus as their starter list.

The next ten pages contain examples and comments about the two thesauruses, followed by two pages of examples and comments about the post-on list.

Comments About the Book-Type Thesaurus

An example of synonymy. While "induced activity" may be referred to in the document, the keyword for it is RADIONUCLIDE, INDUCED. Reviewers are asked to spot synonyms and send them to the editor for inclusion in the book-type (master) thesaurus.

Notice that synonyms are printed in lower-case letters; keywords in all capitals.

Related terms. In the master thesaurus, we do not indicate many related terms. Reviewers will find most such terms in the dictionary and should prepare their own lists. This will help keep the master thesaurus from becoming unwieldy.

Examples from the Book-Type Thesaurus

Keyword number. We use words; the computer uses numbers.

INDIUM	0826
induced activity	
RADIONUCLIDE, INDUCED	
INELASTIC BEHAVIOR	1469
INFILTRATION	1098
infinite plane SOURCE	
INFORMATION RETRIEVAL	1355
DATA PROCESSING	
INGESTION	0202
INHALATION	0203

Comments About the Book-Type Thesaurus

More related terms. When the main thrust of a document is about the IMPACT PROPERTY of some structural material, for example, which of the indented keywords can you use to complete the thought expressed in the document?

We use combinations of keywords to describe certain concepts (helps keep the size of the thesaurus within reasonable bounds). Here, the concept is the interaction between cores. To represent it, we use the two indented keywords. Reviewers are encouraged to submit such combinations rather than suggest a new keyword to denote a new concept.

Cross references to keywords. Note that cross references are printed in lower- and upper-case letters. The words in upper-case letters represent the first words in these two keywords. Reviewers must then look them up to get the exact form of the authentic keywords.

Examples from the Book-Type Thesaurus

IGNITION	1253
IMPACT PROPERTY	1254
CREEP	
CREEP PROPERTY	
NDT DATA	
STRESS RUPTURE	
TENSILE PROPERTY	
IMPACT SHOCK	0528

core interaction	
COUPLED CORES	
NEUTRON INTERACTION	
CORE MELTDOWN	0849
CORE REFLOODING SYSTEM	1498

measurement, DOSE	
MEASUREMENT, GENERAL	0240
measurement, IN core	
MEASUREMENT, NOISE	0937

Comments About the Book-Type Thesaurus

We have many of these related terms, which relate class of reactor to members of that class. When you review a document about a Hanford reactor [HANFORD (PR)], you must also use the keyword REACTOR, PRODUCTION to indicate the type of reactor.

Class of Reactor

Member of Class

Key concepts are grouped alphabetically. A scan through the thesaurus will show other such convenient groupings. The thesaurus is arranged according to two systems: alphabetical and "alpha-logical".

Examples from the Book-Type Thesaurus

REACTOR, PRODUCTION
  HANFORD (PR)
  NPR (PR)
  SAVANNAH RIVER (PR)

ACCIDENT, LOSS OF COOLANT	0230
ACCIDENT, LOSS OF FLOW	0231
ACCIDENT, LOSS OF LOAD	0232
ACCIDENT, LOSS OF POWER	0233

HEAT TRANSFER EXPERIMENT	1158
HEAT TRANSFER, BOILING	0026
HEAT TRANSFER, CONVECTION	1216
HEAT TRANSFER, LOW DENSITY	1159
HEAT TRANSFER, NATURAL CONVECTION	1055

Comments About the Chart-Type Thesaurus

The dagger indicates that the word has been defined. Words without daggers represent an open invitation to the reviewer to submit definitions.

For the reviewer's convenience, we put the second word in plain view by not repeating the first word, in this instance, ACCIDENT. Use complete keyword, including the comma, on the green sheet.

By inspecting the complete chart, you will see that concept words have been fairly well separated from "thing" words (reactors, rivers, etc.). This is intended to help the reviewer use the chart. In selecting keywords, the mind seems to operate in two modes: the digital (naming things, for example) and the analogic (selecting keywords that indicate relationships between the concepts and the things discussed in a document, thus describing the author's "story line"). In other words, the keywords on the chart are arranged in accordance with what seems to be the basic intellectual style of scientists and engineers.

The little arrow indicates a new word, added since the previous edition of the chart.

Examples from the Chart-Type Thesaurus

A Ablation
†Acceleration
†Accellerator
†Accident Analysis
Accident Model
†Accident, Cold Coolant
  , Consequences
  †, Control Rod Dropin
  †, Control Rod Ejection
  †, Control Rod Withdrawal
  , Criticality
  †, Fuel Slump
  , General
  †, Hypothetical
  , Load Rejection
  †, Loss of Coolant
  †, Loss of Flow
  †, Loss of Power
  †, Loss of Pressure
  †, Maximum Credible (MCA)
  , Monitor
  , Nonnuclear
  , Nonreactor
  †, Radioisotope
  †, Reactivity
  †, Refueling
  †, Steam Line Rupture
  †, Transportation
†Accumulator
†Activation
†Activation Energy
Activation Product
Activity Buildup
Actuator
†Additive

Comments About the Chart-Type Thesaurus

"Thing"words. Our aim is to make a complete separation of the things (elements, reactor components, rivers, geographical locations, etc.) and the concepts encountered in nuclear safety. To a large extent, we have succeeded, but it remains to be seen whether a complete separation of the two is possible. It may lead to an unwieldy fragmentation.

ELEMENTS, COMPOUNDS, NEGATIVE RADICALS, AND ALLOYS

Actinium
Actinon
Aluminum
Americium
Antimony
Argon
Arsenic
Barium
Berkelium
Beryllium
Bismuth
Boron
Bromide
Bromine
Cadmium
Calcium
Californium
Carbide
Carbon
Carbon Dioxide
Carbon Monoxide
Cerium
Cesium
Chloride
Chlorine

GEOGRAPHICAL LOCATIONS

Alaska
Argentina
Australia
Austria
Belgium
Brazil
Bulgaria
Canada
Canal, Isthmian
Ceylon

Comments About the "Post-On" List

The post-on list, which is used by the secretaries, lists the reactors, reactor types, and location if outside the U. S. Keywords denoting type and location are indented under the name of the reactor.

When a reviewer keywords a document about one of the listed reactors, he also includes the first of the keywords that describe the type of reactor. The secretaries add the remaining ones, if any.

We pay particular attention to nuclear-safety information pertaining to specific reactors, types of reactors, and where located. For example, safety information about the NRX reactor goes into five pigeonholes, allowing us to make general or specific searches for certain information, depending on what must be done to satisfy our subscribers.

Example of the "Post-On" List

- NRX (TR)
  - REACTOR, TEST
  - REACTOR, HWR
  - REACTOR, PRESSURE TUBE
  - CANADA

- OCONEE 1 (PWR)
- OCONEE 2 (PWR)
- OCONEE 3 (PWR)
  - REACTOR, PWR

- OLDBURY (GCR)
  - REACTOR, GAS COOLED
  - REACTOR, GRAPHITE MODERATED
  - UNITED KINGDOM

The "Mechanics" of Compiling the Dictionary

Assembling the dictionary offers no problems to the editor:

1. The reviewers submit new keywords and definitions on a 3-x-5 card.
2. The card is edited and set aside with others until 10 or 15 are collected, at which time the words and definitions are typed on bond paper and copies are sent to the reviewers.
3. Periodically, a secretary prepares a new edition of the dictionary and distributes Xerox copies to the reviewers.
4. Keep all the 3-x-5 cards in a card file so you can keep track of details not shown in the dictionary: submitter and date of submission.
5. When a new keyword is accepted, write or print the word in both the book-type and chart-type thesaurus. Then, when new thesauruses must be printed, submit the old ones with their hand-lettered or written additions.

Shown below is an example of a keyword and definition submitted to the editor:

> EARTHQUAKE ENGINEERING
>
> The art and science necessary to the design and construction of safe structures in zones susceptible to earthquakes. The term is often used with SEISMIC ZONE; SITING, REACTOR; SITING, CHEMICAL PROCESS PLANT; other "earthquake" keywords. (JGM, 12/15/66)

Keeping the Thesaurus at the Computer Center Up to Date

The computer center also has a thesaurus (keyword list, really, because synonyms, related terms, etc., are not entered), and the editor must keep it current. Notification of new keywords, replacements, etc., are made as follows:

1. New keywords are usually sent along by entering the word on the green sheet, in the space labeled "New Keywords".
2. Replacements are submitted on the usual 80-column-entry sheet for use at the computer center. Suppose that we have two words in the thesaurus (CONTAINMENT INTEGRITY and INTEGRITY) and decide that one will do: INTEGRITY. And we also want all the CONTAINMENT INTEGRITYs in past inputs to be changed to INTEGRITY. There is a coding format for this, and the instructions must be submitted on the 80-column forms.
3. Respellings (computer-center jargon for "make a slight change in the keyword") are also indicated on the standard forms. For example, suppose that we want to change the Roman numeral I to an Arabic 1 in the name of a reactor - DRESDEN I, for example. This too is done by a coding format supplied by the programmers.
4. Deletions are also handled formally by using the entry sheets.

More complicated alterations to the list of keywords at the computer center require the help of a programmer.

Keywords and Related Keywords: Use of Visual Aids

To help new reviewers keyword documents and also remind them of related terms, we include visual aids in our dictionary. The visual aid shown on the opposite page is an example of the collection that we are accumulating.

Many of the labels are keywords. An obvious improvement in labeling would consist in the use of boldface lettering to denote keywords; this enhancement will be added during revision.

Each reviewer is expected to submit similar graphic representations, not only to provide the new reviewer with the "big picture" but to help him grasp the idea behind related keywords and their importance to the storage and retrieval of information.

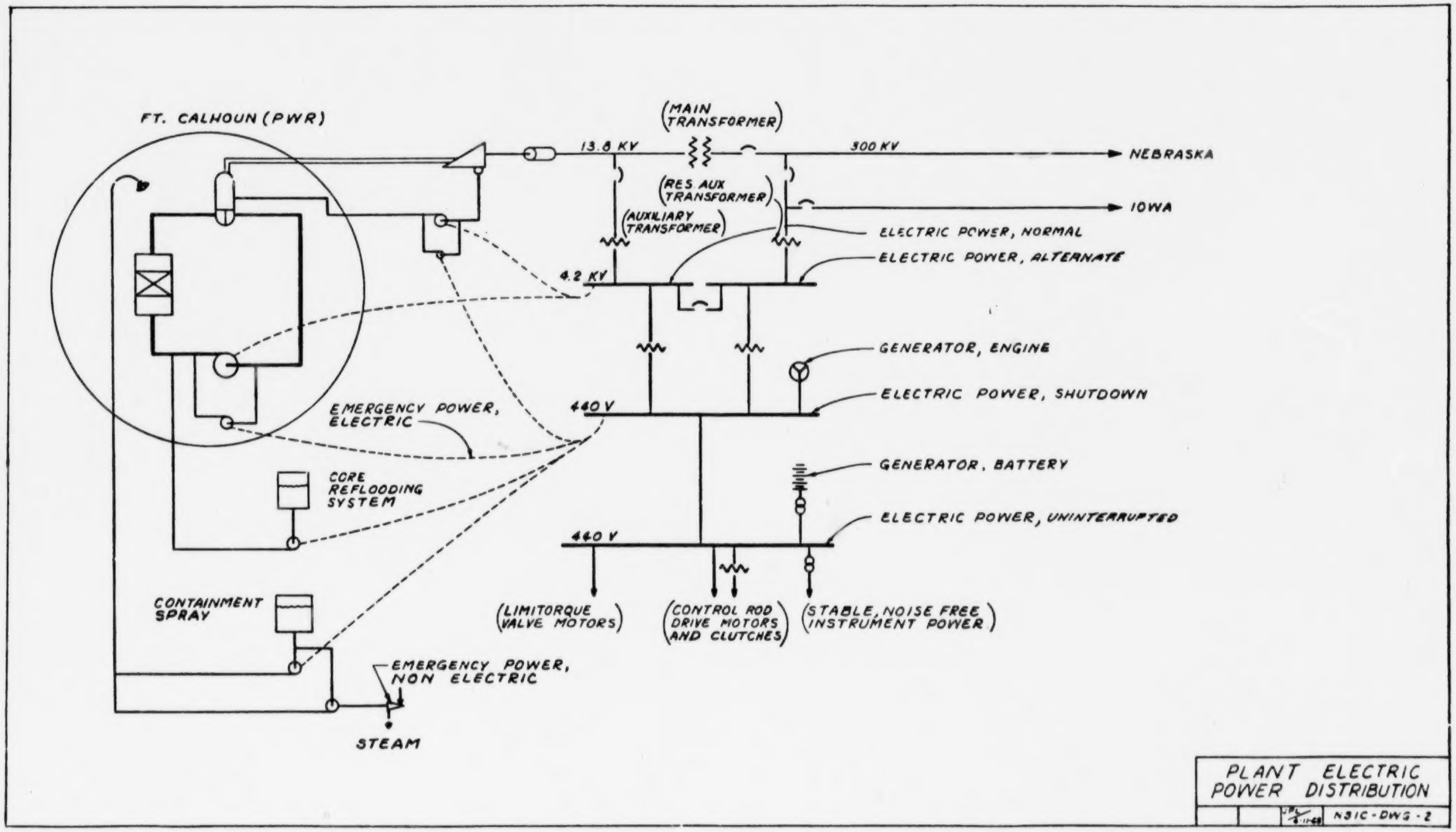
FT. CALHOUN (PWR)
(MAIN TRANSFORMER)
13.8 KV
300 KV
NEBRASKA
IOWA
(RES AUX TRANSFORMER)
(AUXILIARY TRANSFORMER)
ELECTRIC POWER, NORMAL
ELECTRIC POWER, ALTERNATE
4.2 KV
GENERATOR, ENGINE
ELECTRIC POWER, SHUTDOWN
440 V
GENERATOR, BATTERY
ELECTRIC POWER, UNINTERRUPTED
440 V
(LIMITORQUE VALVE MOTORS)
(CONTROL ROD DRIVE MOTORS AND CLUTCHES)
(STABLE, NOISE FREE INSTRUMENT POWER)
EMERGENCY POWER, ELECTRIC
CORE REFLOODING SYSTEM
CONTAINMENT SPRAY
EMERGENCY POWER, NON ELECTRIC
STEAM
PLANT ELECTRIC POWER DISTRIBUTION
NSIC-DWG-2

Fig. 1. Generalized Scheme of Internal Distribution of Electric Power in a Reactor Plant, Illustrating Systems Described by Our Keywords. Most of the labels are keywords.

ORNL-NSIC-47

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